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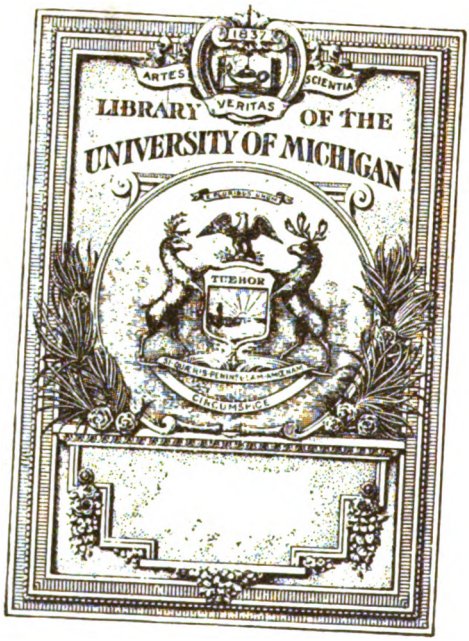

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I. D. 1211

A MANUAL OF ALSACE-LORRAINE

JUNE, 1919

NAVAL STAFF
INTELLIGENCE DEPARTMENT

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NOTE

ALSACE-LORRAINE, as the term is used in the following chapters, is understood to cover three geographically determined areas: the Lorraine plateau, the Vosges mountains, and the plain of Alsace. The district annexed in 1871 by Germany and known as the Reichsland does not include the whole of this threefold region. Over half the Lorraine plateau and a great part of the Vosges lie outside it, and constitute a district which we may describe as French Lorraine.

The political limits of the Reichsland are definite; those of French Lorraine are not, since the province of Lorraine no longer has a political existence. But French Lorraine is very tolerably well represented by the three departments of Meuse, Meurthe-et-Moselle, and Vosges. Accordingly the term Alsace-Lorraine may be taken politically to cover the following territories: Alsace as annexed to Germany in 1871; the territory of Belfort, being that portion of Upper Alsace (department of Haut-Rhin) which was not annexed by Germany and may therefore be described as French Alsace; Lorraine as annexed by Germany; and the three French departments of Meuse, Meurthe-et-Moselle, and Vosges.

Geographically the term Alsace-Lorraine has a slightly different signification. In the first place the three departments enumerated above do not quite satisfactorily represent the extent of the Lorraine plateau in France. The western region of the Meuse department and the south of the Vosges department fall outside it; while on the other hand a part of the Vosges mountain system falls within the department of Haute-Saône, and part of the Gap of Belfort within that of Doubs. Secondly Alsace, as a political expression, includes about half the Vosges and a part of the Lorraine plateau (viz., the so-called *krummes Elsass* or 'Alsatian Lorraine', round Saarunion and Lützelstein, *Kreis* [Zabern), while Alsace as a geographical unit consists of the Rhine plain only. And similarly Lorraine as a political province includes the western Vosges and excludes 'Alsatian Lorraine', while geographically

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Lorraine is taken to mean all the plateau-country between Champagne and the Vosges, and only that.

Roughly speaking, then, the area treated in the following chapters is bounded on the north by the frontiers between France and Belgium, France and Luxemburg, the Reichsland and Rhenish Prussia, and the Reichsland and the Bavarian Palatinate ; on the east by the Rhine ; on the south and west by the Alsatian-Swiss frontier, and then by a line running north-west through Montbéliard to the source of the Saône, thence bending south-west to include the sources of the Meuse, then running north-north-west to Bar-le-Duc and north to Stenay on the Meuse. This line may be taken as a rough indication of the geographical limits of Lorraine.

It only remains to add that the first concern of the following chapters is to supply a description of the so-called Reichsland. French Lorraine and the territory of Belfort have also been dealt with, but in many respects less fully. It is necessary to understand the topography, geology, agriculture, &c., of the Lorraine plateau as a whole, in order to understand those of German Lorraine ; but the history of French Lorraine since 1871 is of little importance. Its industry is on the contrary intimately connected with that of the Reichsland.

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PART I

THE COUNTRY

Physical Geography; River Systems; Geology; Climate.

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CHAPTER I

THE VOSGES

General Features

Northwards from Bâle, the Rhine forms a kind of axis on the two sides of which the country is symmetrical. Take a point on the river, such as Breisach, and travel thence either east or west in a straight line. In each case a very flat, low-lying plain is first crossed (low-lying of course in a relative sense only; actually 600 or 700 ft. above sea-level); then comes a sudden and abrupt rise leading into a densely afforested mountain country, formed of crystalline rocks; then, when the mountain range is crossed, a high-lying plateau seamed by low ranges of hills running north and south.

It is explained below, in the chapter on 'Geology', how this symmetry arose: how a dome of crystalline rocks was elevated, lifting on its flanks the edges of the younger superincumbent rock-strata, and how the middle of the dome collapsed so as to form the 'rift-valley' in which to-day the Rhine flows. Here the present geographical facts alone concern us: the flat plain, intersected by the river; the crystalline Vosges to west and the crystalline Black Forest to east; beyond these again the terraced plateaux of Lorraine and Swabia.

To describe the Vosges as the backbone of Alsace-Lorraine would thus be scarcely accurate. We have not two districts, Alsace and Lorraine, symmetrical about the Vosges chain, but three districts, plain, mountain, and plateau, Alsace, Vosges, and Lorraine, symmetrical about the axis of the Rhine with Baden, Black Forest, and Swabia.

But of these districts the mountain, though not an axis of symmetry, may conveniently be described first; for the geography of the Vosges is the key to the geography both of Alsace and of Lorraine.

The southern and eastern boundaries of the Vosges cannot possibly be mistaken. Southward the mountains plunge

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abruptly from almost their maximum height (Bâlon [1] d'Alsace, 1,248 metres or 4,094 ft.), to disappear beneath the plain of Belfort in 8 miles. To east the boundary is even more unmistakable ; the steep slopes almost everywhere abut directly on the flat Alsatian plain, and it is only here and there that any transition is visible, or that the continuity of the mountain-face is broken by projecting spurs.

To north and west on the other hand the exact limit of the Vosges is less obvious. Northward the crystalline chain of the High Vosges, roughly extending from the Bâlon d'Alsace to the latitude of Strasburg, passes into the sandstone chain of the Low Vosges, which merge again imperceptibly in the Haardt [2], while this runs on into the Pfalzgebirge, the hills overlooking Mainz, of which the Donnersberg (Mont-Tonnerre) is the culminating point, and the Pfalzgebirge into the Hunsrück extending to the lower Moselle and Coblenz.

But on a closer examination the northward limit of the Vosges can be accurately determined. The red Triassic sandstone of the Low Vosges forms a very characteristic type of hill country ; it nowhere rises to high summits, but weathers into a tangle of precipice and gorge, intersected by long, narrow, winding valleys. This topography extends from the Dabo district in the south in an unbroken belt to Kaiserslautern in the north. Here it terminates in two conspicuous and typical hill ranges, the Frankweide and the Sickinger Höhe, Kaiserslautern standing at the foot of the latter.

Here the red sandstone ends ; and with it ends the characteristic topography of the Low Vosges. There follows the 'Gap of Kaiserslautern', a belt of comparatively low and open country with a Permian subsoil, a district easily traversed in every

[1] This spelling, which correctly represents the pronunciation, has been adopted by some recent authorities (notably the French map on a scale of 1 : 500,000) and is in every way preferable to the usual Ballon, which distorts both pronunciation and meaning. Vulgar etymology fancies that because the Vosges mountain-tops are rounded (they are not, in fact, more rounded than those of most other mountains) they are locally known as 'balloons' ; and thus the word *ballon* is used by tourists as if it were the Vosgian for 'summit'. In point of fact only five summits are called Bâlon (German *Belchen*) ; and the word appears to be a Celtic name derived from that of the Celtic sun-god Belen, so that its significance is religious rather than descriptive.

[2] Distinguish from the Hart forest of the Upper Alsatian plain. The names are of course etymologically identical ; but a distinction in spelling is made and is convenient.

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direction, and having a very much smaller extent of timber, but broken here and there by large massifs of basalt, dating from eruptions of the Tertiary period. These basalt massifs form rounded, isolated mountains such as Mont-Tonnerre, and it is these that constitute the Pfalzgebirge. Farther north again the Hunsrück is a Devonian plateau with a good deal of timber and peat-bogs, less difficult to penetrate than the Low Vosges, because less cut up by gorges and less precipitous in its hill-sides.

Thus from the Gap of Belfort to the lower Moselle there runs, not a single mountain chain, but a succession of four quite distinct hill regions: the crystalline High Vosges (from the Gap of Belfort to the latitude of Strasburg); the sandstone Low Vosges (thence to Kaiserslautern, and including the Haardt, the Frankweide, and the Sickinger Höhe); the Pfalz plateau with its isolated basaltic heights; and the Hunsrück. With the last-named we have passed altogether beyond the sphere of the Vosges and entered the region of the Rhenish Schiefergebirge.

The western limit of the Vosges may be determined by the same criterion—the limit of the Triassic red sandstone. The crystalline High Vosges form a wedge-shaped massif, with the point northwards; and the sandstone, which to northward of the wedge-point forms the whole breadth of the mountain chain, still continues south of this point, running in a broad belt alongside the crystalline massif. This sandstone belt forms a transitional area between the High Vosges and the Lorraine plateau; but it definitely belongs, not to the plateau, but to the Vosges. The westward edge of the Vosges then must be sought where the sandstone disappears beneath the limestone of the plateau. This line is, naturally enough, marked by a series of towns, each situated where a river emerges from the mountains, namely, Épinal, Rambervillers, and Baccarat.

Here the plateau is very decidedly lower than the mountains, and is dominated by their spurs; but farther north, from about the latitude of Strasburg, the mountains are much less high, and in fact hardly overtop the plateau at all. Seen from the low plain of Alsace they still appear as mountains; but seen from Lorraine they are distinguished rather by their topographical detail—the deep and precipitous valleys, running eastward

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towards Alsace, the vertical sandstone scars, and the dense forest everywhere—than by any superior height. Thus the summits of the plateau are hereabouts on average over 350 metres in altitude; the adjacent summits of the Low Vosges are seldom much over 400.

The Low Vosges is therefore not so much a true hill system, standing up on all sides out of lower ground like the High Vosges, as the edge of a plateau which has been carved into mountainous forms by innumerable streams, while the contiguous portions of the plateau, draining as they still do away from the edge and therefore by slower-flowing streams, have escaped erosion. This dissection has been especially accentuated by the fact that the plateau is here composed of sandstone, which readily lends itself to such sculpture, while the hard limestones and marls farther west resist the action of water.

The south-western edge of the Vosges, between Belfort and Épinal, is not easy to fix with accuracy at first sight. The boundary is sometimes taken to be the Moselle upstream from Épinal to St. Maurice—the mountains on the left bank of the Moselle being considered as part of the 'Faucilles'. This division, which is based on the theory that the Vosges are the watershed between the Rhine and Moselle, and the Faucilles that between the Moselle and Saône,[1] is perpetuated by various maps and by certain writers who describe the Faucilles as beginning at the Bâlon de Servance; but it has nothing to recommend it, and is rejected by all the more scientific geographers. The mountains on both sides of the upper Moselle belong to the same system and show in every respect the same character; if those on the right are Vosges, those on the left have an equal title to the name.

Accordingly the head-waters of the various streams which flow south-westward past Plombières, Val-d'Ajol, Luxeuil, &c., to join the Saône must be taken as lying within the Vosges system; and the limit of the Vosges in this direction must be sought where the mountains merge in the plain of Burgundy. The Épinal–Belfort railway is a sufficient approximation to this line; and accordingly the south-western extremity of the Vosges may be taken as a line drawn through Giromagny,

[1] For further remarks on the 'Faucilles' and the proper application of their name see below, p. 74.

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Champagney, Melisey, Fougerolles, Xertigny, and Épinal. But it must be added that a large area adjacent to this line, the lower part of the plateau sloping up from it to the Saône–Moselle watershed, is only a transitional area, and not very mountainous in character.

Finally, the Vosges chain falls naturally into two parts. The distinction between the High and Low Vosges is partly, but not merely, geological; for the sandstone which forms the Low Vosges covers a very considerable area in the High Vosges too. Partly it is a topographical distinction between a dissected plateau on the north and a true mountain system on the south.

Without entering into details, which are reserved for future consideration, it is desirable here to ask how far the Vosges constitute an obstacle to communication, and a true frontier between the Alsatian plain and the Lorraine plateau.

It is obvious that a continuous range of hills, extending 140 miles from Belfort to Kaiserslautern without a break, must form an emphatic line of division between the countries on each side of it. But it is very easy to over-estimate the completeness of this division. Two geographical facts must be borne in mind when the Vosges chain is being examined as a frontier. First, the chain is unsupported at its ends; secondly, it is pierced by a large number of very easy passes.

The north and south ends of the chain are 'in the air'. The Vosges barrier is not, like the Alpine barrier, based at its extremities upon the sea or upon other mountain massifs. At its northern end is the Palatinate gap (the Gap of Kaiserslautern), commanded indeed by the basaltic Pfalzgebirge, but otherwise open and offering easy passage. At its southern end is the Gap of Belfort, a 15-mile belt of flat country between the last slopes of the Vosges and the first ridges of the Jura. Thus the Vosges, whether considered as an ethnic boundary, an economic barrier, or a military obstacle, can always be—and have always been—turned. The Frankish invasions, which gave to northern Lorraine its Germanic dialect, swept through the Palatinate gap and rolled up the Vosges barrier from its northern end; and thus the forest of Hagenau, in the flat Alsatian plain, is a linguistic frontier,[1] but the Low Vosges are

[1] As between the Frankish and Alemannic dialects of German. See below, p. 141.

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not. They constitute not a sea-wall but a groyne, jutting out perpendicularly into a Teutonic sea.

The tide which set in from that sea during the last centuries of the Roman Empire rose in Lorraine till it stopped through its own exhaustion. It met with no obstacle ; its waves merely died on the beach, leaving the language-frontier as their high-water mark. But in Alsace, where the Alemannic invasion swept in from the east, the High Vosges formed a real barrier, against which the flood of Germanism broke. This fact has, ever since, emphasized the value of the High Vosges as a barrier, and indeed somewhat over-emphasized it. For here too the invasion stopped partly by its own exhaustion ; otherwise it would have at least attempted to flow through the open Gap of Belfort, and to occupy the Vosges valleys as far as their heads. But it never reached Belfort, and the heads of the Vosges valley remain French-speaking till to-day.

To minimize the value of the Vosges as a barrier it is not necessary to hold a brief for French claims in Alsace. The following passage, by the leading German geographical authority on Alsace-Lorraine, is extracted from a German official publication, which can hardly be suspected of covert Francophilism :[1]

Especially great is the influence of the Vosges on the population and civilization of the country. This is pre-eminently true of the structure of the Vosges valleys, as exemplified by two characteristics, their great breadth and their length, which brings their heads right to the summit-line of the mountains. . . . Contrast the Black Forest valleys : these are narrow and never lead straight out to the high plateau of the mountain system. Thus the Vosges are more cheerful, sunny, varied in form and colour, and accessible than the Black Forest.

The breadth, roominess, and straightness of the valleys early attracted inhabitants into the hills, which could be so easily crossed at so many places. To mention only these, the cols of Bussang, Bramont, the Schlucht, and the Bonhomme, the Weilertal, the Breuschtal, and the Zabern depression gave comfortable roads over the mountains from the earliest times, descending gently into Lorraine and leading rapidly and easily to centres of civilization. Moreover it is equally easy to go round the Vosges, either by the famous Gap of Belfort, the Burgundian gate of the nations, to south, or at Zabern and

[1] Prof. Gerland, in *Das Reichsland Elsass-Lothringen, herausgegeben vom statist. Bureau des Ministeriums für E.-L.*, vol. i, p. 16.

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elsewhere in the north. How different from the Black Forest, which presented the gravest obstacles to traffic as late as the nineteenth century ! . . .

Thus from the earliest times the Vosges were penetrated and crossed : by prehistoric man, by the ancient Celts and Teutons, by the armies and the merchants of Rome. No hill system in all Germany is easier to travel in or through (*wegsamer, durchlässiger*) than the Vosges ; and it will readily be understood that in all the vicissitudes of German history and the development of German civilization the Vosges have taken an active part, no hill district more so. History has passed other mountain districts by; but the Vosges she has always passed through.

Professor Gerland's remarks are entirely just, and deserve emphasis at a time like the present, when it is too often assumed that any mountain range is necessarily a cultural barrier. In point of fact history shows that the Vosges have never to any great extent formed such a barrier. The wild and forest-clad uplands of Lorraine were a more formidable obstacle to French expansion than the Vosges chain ; and as soon as Louis XIV established his hold upon Lorraine and the Franche-Comté his annexation of Alsace was geographically inevitable. To hold northern Lorraine is to dominate all Lower Alsace ; and from the fortress of Pfalzburg, on the edge of the plateau above Zabern, at a height of about 400 metres, there is an uninterrupted view over the Kochersberg plain to Strasburg, 25 miles away.

In modern times a new influence has arisen to diminish yet further the value of the Vosges as a culture-barrier. This is the industry which has established itself so richly in the mountain valleys on both sides of the High Vosges. Before the eighteenth century these valleys were sparsely inhabited, except for the flourishing towns at their mouths and the great abbeys higher up, with villages along the trade-routes ; but first on the steeper and richer Alsatian slope and then, after 1871, on the Lorraine side an enormous growth of industry set in, which transformed these valleys into ribbons of manufacturing towns comparable only with some of the Yorkshire and Lancashire valleys. Thus to-day only a few miles of good road separate the highest mills of the French side from those of the German side ; and it is political, rather than geographical, conditions that alone check free and continuous traffic over the passes.

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The High Vosges

The two divisions of the Vosges—the High Vosges in the south and the Low Vosges in the north—differ completely, as has been pointed out, in geographical character. The High Vosges, extending from the latitude of Mulhouse to that of Strasburg, form an independent mountain system which demands separate treatment.

The High Vosges cover an egg-shaped tract of country 70 miles long from north-north-east to south-south-west, and 45 miles across at broadest. The smaller end of the egg lies to the north, the larger to the south, adjoining the Gap of Belfort. The greatest breadth is thus south of the centre, and lies on the line joining Épinal in Lorraine to Rufach in the Rhine plain. This line passes through the summit of the Hohneck, which is the geographical centre of the High Vosges.

The High Vosges are composed of a number of ridges, all running parallel to the major axis of the oval. These ridges, with the valleys which separate them, are considered by geologists to be a relic of the topography which characterized the lofty mountains standing here in the Carboniferous period. Worn down as these mountains were by erosion, and covered with the marine deposits of a later age, their earlier shape is supposed to have reasserted itself when they emerged once more from the sea, and erosive action removed from their surface the softer formations which had been deposited since their subsidence. Thus the present configuration of the High Vosges is based upon, and to some extent reproduces, the configuration of the original mountain system.

The disturbances of the Tertiary epoch also produced their effect on the Vosges topography. At this period the Rhine plain, originally a high plateau level with the tops of the Vosges, was shattered and sank; and it sank, not as a whole, but in a great number of independent sections separated by faults. The central sections sank most rapidly, and are to-day deeply buried beneath Tertiary and Quaternary deposits; but the marginal sections sank more slowly, and thus were formed the Vosges foothills, consisting of fault-dissected blocks which have sunk indeed, but not, as yet, to the general level of the plain. It is probable that many other portions of the eastern Vosges have sunk owing to the same causes, and that some features

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of their topography are due to this fact rather than to the topography of the Primary epoch. The fact seems to be proved by the occurrence of Triassic sandstone on the summits of most of the eastern mountains, while the higher central mountains are wholly composed of granite and gneiss. This strongly suggests that a subsidence has taken place in the eastern High Vosges which has so far lowered the general level as to preserve the Triassic strata from erosion when farther west the same strata, left standing at a higher level, were completely denuded away.

To this system of parallel ridges and valleys we must add two other factors in order to give a complete account of the topography of the High Vosges. The first of these is the system of transverse valleys, breaking at right angles through the parallel ridges ; the second is the tendency of all the valleys to radiate from the Hohneck. The first can most easily be studied within a radius of four or five miles from Gérardmer,[1] where the narrow parallel valleys are as regular as those of the Jura, and are broken into, like them, by *cluses* which allow their waters to escape into the next valley. Most of the Vosges valleys show a combination of these two features : thus the Moselle flows in a longitudinal valley as far as St. Maurice, and then in a transverse ; the Meurthe alternately in longitudinal and transverse valleys ; the Vologne in a transverse valley (containing a remarkable gorge below Gérardmer) to Bruyères, and then in a longitudinal.

The other tendency, which makes most of the valleys radiate in some degree from the Hohneck, justifies our description of that summit as the geographical centre of the Vosges. It is not the highest point (the Grosser Belchen is 63 metres and the Storchenkopf 1 metre higher), but it is the highest point of the main watershed, and the Meurthe, Moselotte, Vologne, and Fecht all rise on its slopes. The head-waters of the Alsatian side flow almost invariably away from the Hohneck : the Thur begins by flowing south, the Fecht east, the Leber (Liepvrette) north-north-east, and the Breusch (Bruche) north. On the Lorraine side the same tendency is present, though less regular.

[1] The final *-er* in the Vosges is regularly pronounced *-é*. Pronounce *Gérardmé* ; in local dialect, *Girômoué*. In a few cases (notably Longemer, Retournemer) the termination is pronounced *-ère*.

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These three features—parallel ridges and valleys, transverse valleys, and radial tendency—together account for most of the main features of the High Vosges, and must be borne in mind during the detailed description of the country.

The general relief of the High Vosges can be briefly described. It is not a country of isolated peaks. The mountains consist of long and very regular ridges, whose smooth tops now rise to a summit, now sink to a pass, the two being seldom more than 200 or 300 metres apart in the vertical scale.[1] The tops of the ridges are broad and grassy; they have afforded semi-alpine grazing-grounds from time immemorial. The ascent to a col is generally steep, but along the ridge going is almost always easy and good, except for occasional peat bogs. These ridges fall steeply into the valleys; but in general one side of the ridge—the east as a rule—is precipitous and rocky, interrupted by rock-buttresses enclosing corries in which mountain tarns [2] lie, while the other side slopes down more gradually, in a curve of convex profile, gentle at first and then steeper.

The valleys are broad, open, and straight, with flat bottoms. They are of the so-called 'trough' type commonly found in glaciated mountain districts; and indeed evidences of glaciation are conspicuous throughout the High Vosges.

In all these features the Vosges closely resemble the mountains of the British Isles. The combination of precipice, buttress, and tarn on one side of a ridge and gentler grass slope on the other, the open ridge affording an easy path and an expanse of summer pasture, and the flat-bottomed trough-valley are among the main characteristics of the English Lake District mountains, and are repeatedly exemplified in Wales and Scotland. In fact the High Vosges form a mountain system more closely allied, both in topography and in geological history, to the 'Caledonian' type than to the 'Alpine'.

The main difference between the Vosges and the British hill systems is that the former are very densely covered with forest. Broadly speaking, the whole of the Vosges are covered with large timber—beech and conifers mostly, with some chestnuts,

[1] The Col de Bussang, 500 metres below the neighbouring heights, is the only important exception; and this pass leads over the Bâlon d'Alsace ridge, which, as we shall see, is more serrated than the others. The Col de Saales is still lower; but it leads between two ridges, not over any one.

[2] These are further discussed in Chapter IV.

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oaks, &c., at the lower levels—except the flat valley-bottoms and the immediately adjacent slopes, useful as arable and vineyards, on one hand and the open grassy tops on the other. These grassy tops, the so-called Hautes-Chaumes, are very characteristic of the Vosges. The beeches become more and more stunted as one ascends, till finally, about the 1,000-metre contour-line, they disappear, leaving rich turf and peat. These summer pastures were originally a natural feature, but have been extended by artificial means; they have always been a valuable asset both to Alsatians and Lorrainers, and their use has for many centuries formed a link between the two countries and given rise to countless disputes. The *marcaires* take their cattle up in May or June (*marcaire*=*Melker*, 'milker') and live in the *marcairies* (*Melkereien*), making cheese, till September. The word *chaume* is the Low Latin *calma*, 'waste land'; the German is *der First* or *die Firste*, literally 'king-post', hence 'roof-tree'. Place-names, such as Château-sur-Fête, Gazon-de-Faîte, Champ-du-Feu, are derived from the German word.

The main watershed, which is followed by the Franco-German frontier from the Bâlon d'Alsace nearly to the Donon, lies not on one of the parallel ridges, but in different sections on three different ridges. In the south it follows the ridge which we shall call the Bâlon d'Alsace ridge from the peak of that name as far as the Col de Bramont at the head of the Thur valley. Here it moves across eastward to the next ridge, the Hohneck ridge, which it follows for some distance and then jumps back westward to the Bâlon d'Alsace ridge, striking it just south of the Col du Bonhomme. It now follows this ridge as far north as the Climont, and then makes another leap, across the Col de Saales, to a third ridge, the Donon ridge.

These three ridges between them contain all the main summits of the Vosges, and will now be described in order.

The Grosser Belchen–Hohneck–Bressoir Ridge

The Hohneck ridge runs parallel to the main system in its central portion; its two ends curve eastward, giving the whole ridge a crescentic shape. This ridge contains most of the chief Vosges summits. Its southern extremity is the Grosser Belchen[1]

[1] The nomenclature of the Vosges peaks is extremely confused. Almost very mountain has a French and a German name, often several different

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(Grand Bâlon, Sulzer Belchen, Bâlon de Guebwiller), the highest peak in the Vosges (1,423 metres). This mountain is composed almost entirely of slates and greywackes of the early Carboniferous period; its contours are smooth and devoid of crags and precipices, though its slopes are steep. Together with its satellites, the Sudelkopf, Molkenrain, Hartmannsweilerkopf, &c., it forms a vast massif dominating the Lauch valley to north and the Thur valley to south and west. Close beneath the bare summits, and enclosed among hanging woods, is the Belchensee (Lac du Bâlon), the first Vosges mountain tarn to be dammed.

From the Grosser Belchen the ridge, fairly level and broad, with turf on the summit and forest on the slopes, runs northwest and then north. After a few miles it sends out a long spur of the same general height and character north-eastward; this culminates in the Kleiner Belchen (Kahler Wasen, Petit Bâlon), 1,268 metres, from which lower ridges run down to Gebweiler and Colmar.

The Grosser Belchen and Kleiner Belchen enclose the Lauch valley. This is one of the minor Vosges valleys; it contains no great main road and leads to no pass. Gebweiler, the town at its mouth, owes its prosperity rather to local products (wine and manufactured goods) than to traffic, and the upper valley is remarkable only for its beautiful scenery and the rich vegetation which gave it the name of Florival or Blumental. It is also known as the seat of the once famous monastery of Murbach.

The main ridge now runs north to the Rainkopf (Rheinkopf), 1,298 metres, where it becomes for the next 10 miles the main watershed. Its general character is fairly consistent. It is a granite ridge, dropping in great crags eastward into the heads of the Alsatian valleys; the continuity of the crags is broken by ribs or spurs, between which lie mountain tarns. The west side slopes down more gently to the heads of the Lorraine valleys; on this side there are no crags and no tarns, except for one short section close to the Rainkopf summit. The top of the ridge is comparatively level, broad, and grassy, in places peaty; magnificent forests of beech and pine grow on the slopes. The summits stand at no very great height above the

names in each language. As a dozen miles of ridge may easily contain a dozen summits, it is impossible to enumerate more than a very few.

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lowest points of the ridge: thus the Hohneck, the highest point, is only 247 metres above the adjacent Schlucht pass (1,139 metres).

North of the Schlucht comes the broadest and most open of all the Vosges summits, the Hautes-Chaumes, so called *par excellence* as typical of the high pastures of the Vosges.

From the Kleiner Belchen to the top of the Hautes-Chaumes this ridge skirts the Fecht valley or (from its chief town) Münstertal. This is one of the larger Vosges valleys, and drains a large area of upland on the eastern slope of the watershed. At the town of Münster, a busy manufacturing centre, the broad and flat-bottomed valley divides into two branches, separated by a lofty spur projecting due eastward from the summit of the Hohneck. The northern branch carries the Schlucht road, the direct line of communication between Gérardmer and Colmar.

The Hautes-Chaumes massif is separated from the Bressoir, which continues the same ridge northward, by a complete break, through which flow eastward the waters of the Bechine or upper Weiss. The main watershed therefore leaves the Hohneck ridge here and moves westward again to the Bâlon d'Alsace ridge. The Bressoir (Brézouard, Birschberg) and its northern continuation, the Tännchel, curving round north-eastward, form the last heights of the Hohneck ridge and the northern horn of its crescent. The Bressoir is a huge granite massif much resembling the Hautes-Chaumes; below its ridge in a high and lonely basin lies Aubure (Altweier), the highest Vosges village. A slight col separates the Bressoir from the Tännchel, a long ridge whose summit is composed of red sandstone weathered into innumerable fantastically shaped rocks.

The Weisstal is a curious feature of the Vosges. Separated from the Münstertal by the long sandstone ridge of the Hohneck—a branch separating itself from the main chain at the summit of the Hautes-Chaumes and extending northwards as far as the Bressoir—it forms a high upland basin of comparatively open country, shut off from the rest of Alsace by the narrow and gorge-like lower Weiss valley, and communicating with Lorraine through the gap above described between the Hautes-Chaumes and Bressoir, and so over the Col du Bonhomme. This basin has always therefore been a little world by itself, preserving its own life and its Romance dialect. Its

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four chief villages, La Poutroye, Orbey, Fréland, and La Baroche, have all been given official German names, but the population is entirely French-speaking.

The Bâlon d'Alsace–Champ-du-Feu Ridge

This ridge has been so much broken through by the head-waters of the Vologne and Meurthe that in the neighbourhood of the Schlucht it is hardly recognizable. Its north and south sections are, however, very clear and very characteristic. Its average height is decidedly less than that of the Hohneck ridge ; instead of often exceeding 1,300 metres for considerable stretches together, it never reaches 1,250. In the southern section its summits are generally about 1,200 ; in the northern, 1,000.

It also differs very strikingly from the Hohneck ridge in being rougher, more craggy and serrated, more deeply cut into by cols and rising more sharply into peaks. It seldom has level *chaumes* on its summit. Woods and rocks cover the greater part of its surface, except in the extreme north ; and for some unexplained reason it never, except for one short and well-marked section in the extreme south, has the corries and tarns which are so characteristic a feature of the Hohneck ridge. Various explanations of these differences have been suggested, but none seems very convincing.[1]

The Bâlon d'Alsace (Welscher Belchen, Elsässer Belchen), 1,248 metres, has a dome-shaped summit falling in precipices of purple granite eastward into the caldron-like head of the Doller valley, and less steeply on the other sides. It forms the meeting-place of four ridges. To south-east runs the Bärenkopf ridge, the frontier between France and Germany ; it drops into the Alsatian plain at Rougemont-le-Château, after running about 8 miles. Across the Giromagny valley lies the rather similar ridge of the Bâlon de St. Antoine, running south-west from the Bâlon d'Alsace. To north-west runs the Bâlon de Servance ridge, sometimes called a part of the Fau-

[1] Barré suggests that the western portions of the Vosges, having been more thickly covered with Secondary formations, have been less exposed than the eastern to glaciation and weathering ; Gerland, who denies that the tarn-basins are due to glacial action, tries to reduce all phenomena to the effects of faulting in the Tertiary period—an expedient which involves assuming the existence of huge faults not yet proved to exist. Neither explanation covers all the facts.

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cilles (see p. 18). This is a long straight ridge, traceable as far as Épinal, 30 miles in all. Northward it falls steeply into the straight trough-like valley of the Moselle ; southward it declines gently in a long, gradual slope dotted with numerous lakes and seamed by a series of deep, parallel valleys (the Rahin valley, with Plancher-les-Mines ; the Oignon, with Servance ; the Breuchin, with Faucogney ; the Combeauté, with Val-d'Ajol ; and the Augrogne, with Plombières-les-Bains, the favourite watering-place of Napoleon III). This district is the south-western margin of the Vosges.

The ridge which we are to follow runs north-east from the Bâlon d'Alsace. Flanked by granite precipices, it descends to the Col des Charbonniers and rises again to the Gresson, whence another important branch runs off eastward—the Rossberg—forming the boundary between the Doller and Thur valleys.

The Dollertal is a short and unimportant valley. Surrounded as it is at its head by the crags of the Bâlon d'Alsace and the Gresson, only crossed by the mountain path of the Col des Charbonniers, it is inaccessible except from the east, where lie the smallish industrial towns of Sentheim and Masmünster. The wild scenery at its head recalls the heads of the Fecht and Weiss valleys, under the Hohneck and Hautes-Chaumes ; here again we find mountain tarns perched in corries and surrounded by precipices. This feature nowhere recurs on the Bâlon d'Alsace ridge.

From the Gresson the ridge runs northward. It descends steeply from over 1,200 metres to the Col de Bussang (731 metres), one of the lowest passes in the High Vosges and by far the lowest which directly pierces one of the main ridges. The carriage-road is made still easier by a tunnel piercing the crest of the ridge.

The Moselle valley may be surveyed from this point, as the true source of the Moselle is generally taken to be a perennial spring rising at the Col de Bussang. Flowing at first as a mere *goutte*, or mountain stream, in a *colline*, or narrow, straight, and gorge-like valley, at St. Maurice the Moselle turns a right angle and begins to flow in the direction of Toul through a flat-bottomed, quickly widening valley, which cuts perpendicularly through the successive ridges of which the Vosges are composed, and thus picks up the drainage of each longitudinal valley. The Moselle is one of the main lines of communication in

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the whole of the High Vosges, for it gives an exceptionally easy and direct approach to an exceptionally low pass.

From the Col de Bussang the ridge rises steeply again to another high peak, the Drumont, and then steeply sinks once more to the Col d'Odern, a pass of secondary importance connecting the upper Thur valley with Saulxures in the Moselotte valley. North of the Ventron (1,202 metres) is yet another carriage-road pass, the Col de Bramont, leading from the very head of the Thur valley to La Bresse on the Moselotte. This is a more important pass than the Odern; but both are minor passes, carrying local traffic only and not competing for through traffic with the lower and more direct Col de Bussang.

The Thur valley, which we have been following from the Gresson to the Col de Bramont, is one of the wildest and most mountainous valleys of the Vosges. It is completely surrounded by mountains of well over 1,000 metres; the Rossberg, Stiftkopf, Gresson, Tête-des-Neuf-Bois, Ventron, Rainkopf, Schweisel Wasen, Treekopf, Tête-du-Chien, Grosser Belchen, Sudelkopf, and Molkenrain are all among the largest peaks of the Vosges, and all stand close above the valley, descending into it with a slope that is always steep and generally precipitous. Above Wesserling the valley is especially striking. The bottom is flat and empty, traversed here and there by glacial moraine-mounds and interrupted in one place by the abrupt granite monolith on which stands the ancient castle of Wildenstein; and on each side slopes of extreme steepness rise unbroken for some 2,000 feet.

Westward from the ridge runs the Moselotte valley. It rises, like that of the Moselle, in a number of longitudinal *collines* which gradually drain into one main valley, and finally debouch into the Moselle at Remiremont.

North of the Col de Bramont the ridge is cut through by the head-waters of the Lorraine streams and loses all continuity. We are now in the Vologne basin. The Vologne (from the German *Wolln*, so called because of the cotton grass which abounds in the *fanges* or peat-hags hereabouts) rises on the Hohneck and feeds the lakes of Retournemer and Longemer, valley lakes quite different in type from the mountain tarns we saw on the other side of the watershed. After leaving the Longemer, it passes the lake and town of Gérardmer, the Chamonix of the Vosges, a flourishing tourist-centre of ove

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10,000 inhabitants. The lake is curiously situated on a col, like the Lac de Champex in Switzerland; it drains eastward into the Vologne, but not half a mile from its other end another stream rises which flows westward. At one time the Vologne seems to have flowed through the lake, as through the Longemer, till the great gorge below Gérardmer was opened and captured its waters. On emerging from this gorge the Vologne flows through an open, fertile valley to Bruyères, where it turns abruptly left to join the Moselle at Jarmenil.

North of the Schlucht we pass into the Meurthe basin. The main source of the Meurthe is in a peat-bog just under the Schlucht itself. The stream flows through a deep and lonely *colline* northward till it escapes by a *cluse* pierced through the Bâlon d'Alsace ridge at Xéfosse.[1] After collecting various small tributaries it emerges into the St. Dié basin. This is a broad depression in the very heart of the High Vosges, surrounded by crystalline mountains, densely afforested, and containing low hills and rolling country of sandstone (Permian). At St. Dié the basin ends, and the Meurthe flows through a gorge into another open basin, that of Moyenmoutier, beyond which it again enters a gorge (the gorge of Raon-l'Étape) and so escapes, at Baccarat, into the plain of Lorraine.

The Bâlon d'Alsace ridge takes shape again at Xéfosse, mentioned above as the place at which it is pierced by the head-waters of the Meurthe. Immediately north of this it becomes once more the main watershed of the Vosges, and is soon afterwards crossed by the Col du Bonhomme leading from Le Bonhomme (Diedolshausen) on the upper Weiss to Fraize in the St. Dié basin, or in a larger sense from Colmar to Lunéville and Nancy. The col is 931 metres above sea-level; the ridge here, where open pastures alternate with pine woods, only averages about 1,000 metres, and is steadily declining in height. A few miles later comes the Col de Ste. Marie (753 metres), connecting St. Dié with the Markirch valley and Schlettstadt.

The Lebertal (Liepvrette valley), with its capital Markirch or Ste. Marie-aux-Mines, is one of the larger Alsatian valleys, but for scale and magnificence of scenery is far behind the valleys of the south. The northern slopes of the Bressoir and Tännchel, which form its southern side, are gentle and monotonous.

[1] The letter *x* in the Lorraine dialect represents a strongly aspirated *h*, which is one of the traces of Teutonic influence on the dialect.

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It is only among the rather tangled tributary valleys of the north side that there is any really mountainous landscape. As far up as Markirch the valley is broad and open. Here the main St. Dié road leaves the Liepvrette and ascends a side-valley, while the main valley, turning south-westward, becomes a narrow gorge carrying a second-class road over the Col des Bagenelles to Le Bonhomme. Here too, as in the Weiss valley, there are considerable remnants of a Romance-speaking population. The formation is mostly gneiss.

The main ridge continues north till, where it overlooks the Col de Saales to westward and the Weilertal to eastward, it has almost ceased to be a continuous ridge and become a range of isolated peaks, of which the conical Climont (966 metres) is the most conspicuous.

The Weilertal (Val de Villé), or valley of the Giessen, consists of an upland basin partly of Romance speech, in many ways resembling that of the Weisstal, drained by a valley which just above its mouth unites with that of the Liepvrette. The discontinuity of the ridge at its head provides a low and easy pass over to Saales and so either to Schirmeck or St. Dié; so the Weilertal has always been an important line of communication, as is witnessed by the numerous castles along its course. It is also of interest geologically, as an undoubted relic of the valley system of the Primary epoch, and for the very early pre-Cambrian stratified rocks which it contains. These form a peculiar type of landscape in the upper Weilertal, consisting of precipitous crags on a rather small scale. Round Lalaye and Urbeis the formation is gneiss.

North of the Weilertal the ridge becomes more continuous and lofty, rising to about 1,000 metres and forming the great granite Hochfeld (Champ-du-Feu) massif. This massif extends from a central plateau like that of the Hautes-Chaumes, falling steeply to east and gently to west, in a number of radiating ridges to north and east. The summit and the gentle western slopes are mostly open pastures; the rest is densely covered with magnificent pine and beech forests. The village of Hohwald stands in a lofty basin entirely overgrown with huge pine-trees, and drained by the narrow and gorge-like Andlau valley. The eastern summits of the massif, Mollberg, Odilienberg, and Ungersberg, are topped with sandstone. The Odilienberg is famous both for its religious association with St. Odilia

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(Ottilie), the Alsatian saint, which has made it the chief place of pilgrimage in Alsace, and for its 'pagan wall', a Cyclopean structure some miles in length, evidently a prehistoric defence, though archaeologists disagree as to its date.

Finally, the last spurs of this ridge die away in the plain towards Molsheim.

The Donon Ridge

This ridge may be traced, at its southern extremity, in the Forêt de Fossard, the massif which stands above the Moselle opposite Remiremont, and again in the tangled hills between Bruyères and St. Dié. But it becomes continuous only after the gorge of St. Dié, where the Meurthe penetrates it on emerging from the St. Dié basin. Here it forms the wooded Montagne d'Ormont, about 700 metres high, falling eastward into the St. Dié basin and westward into that of Moyenmoutier. This massif runs in a broken ridge north-eastward, till opposite Saales it becomes the main watershed of the Vosges.

The Col de Saales here connects the St. Dié basin with the Breusch valley, passing over the watershed where it leaps from the Bâlon d'Alsace ridge to the Donon ridge. The pass thus does not cross a ridge at all; it merely traverses a *couloir* between two ridges, where the watershed is at its lowest (560 metres) and hardly perceptible.

The ridge now runs northwards at a general height of 600–700 metres, with peaks rising to 800 and over. On the west are the head-waters of the Rabodeau (Rapida Aqua) flowing down a longitudinal *colline* in which stand Senones and Moyenmoutier; on the east is the Breuschtal. The ridge rises gradually and becomes more continuous. There is a stretch of *hautes chaumes* like those of the southern Vosges at a height of 800–900 metres; and suddenly, from a col (760 metres) carrying a road which connects Schirmeck with the Plaine valley and Raon-l'Étape, the ridge rises to the Donon (1,008 metres). Here for the first time a sandstone summit occurs on a main ridge. The crystalline rocks are gradually sinking, and north of the Donon first the summits and then the lower slopes are composed of Triassic sandstone. Finally, about the Schneeberg (961 metres), the crystalline topography of the High Vosges disappears. The last spurs run out into the plain at Wasselonne (Wasselnheim) and are in a sense continued by the Kochersberg hills.

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The Breuschtal is the northernmost valley of the High Vosges, and one of the largest. Up to Schirmeck it is broad and open; farther up it is narrow and gorge-like, but drains a large upland basin of wild and remote country. On the western slopes of the Hochfeld is the Ban de la Roche, a group of lonely mountain-villages which were brought into the pale of civilization only by the labours of the famous Pastor Oberlin in the eighteenth century, an Alsatian counterpart of the English 'Wonderful Walker'. Here, and on the wooded slopes of the Donon, a Romance dialect still survives.

The Sandstone Ridge

The crystalline massif, which has now been described in detail, dips not only northward, so as to disappear gradually beneath the Triassic red sandstone, but also westward, where it disappears under the same formation. The Triassic sandstone accordingly crops out in a belt separating the crystalline mountains from the Lorraine plateau, and this belt forms another ridge parallel to those already described.

This ridge is the westernmost member of the Vosges system. It has not the height or the steepness of the granite ridges; its summits seldom rise above 600 metres and are generally below 500, but it is fairly continuous and deeply wooded, and accordingly forms a considerable barrier between the Lorraine plateau and the basins of open country which lie within the Vosges in the neighbourhood of Moyenmoutier, St. Dié, Corcieux, Bruyères, &c. Considered as an obstacle, it is no less important than the main watershed; and the only easy ways through it lie in the three river-valleys which pierce it, leading up from Épinal, Rambervillers, and Baccarat respectively, the Moselle, Mortagne, and Meurthe. It falls rather steeply everywhere into the plateau, and its heights, with their fantastic pinnacles and precipitous scars, are less easy of access than the higher but more regularly shaped granite hills.

The Alsatian Foothills

The foothills consist of a series of fragments splintered from the ancient Vosges–Black Forest massif in the Tertiary period, which have sunk almost, but not quite, to the level of the Rhine plain. They have thus kept intact many of the superincumbent strata which have been weathered off the high

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mountains; but, falling as they have to very different levels, the different blocks show a surface of different formation; those which have sunk farthest being composed, at their own exposed surface, of Jurassic strata, while those that have not sunk so far show a surface of Triassic formation.

Thus the geological character of the foothills is extraordinarily varied. Some are red sandstone, some Muschelkalk, some Keuper, others present every variety of Jurassic strata. The only general fact that can with safety be asserted is that in most of the foothills the subsoil is calcareous and as a rule light and dry. The surface is in many cases loess, which adds to the fertility of the region.

The physical aspect of the foothills is no less varied than their geological composition. Sometimes they simply form the lower slopes of the main chain, which passes imperceptibly into them; at other times they form a distinct range, separated by a regular valley from the main chain. In every case their outer face, as determined by faulting, is regular and steep, and plunges abruptly into the levels of the Alsatian plain.

The economic importance of these hills can hardly be overrated. Lying as they do along the foot of the mountains, they present, at a low elevation, the warm, dry, sun-baked slopes so valuable as vineyards. Their geological constitution enables them to provide quantities of building-stone more easily worked than the granite of the main Vosges, and incidentally it supplies them with a great number of mineral springs which have for centuries attracted visitors.

The whole chain of the foothills is thus an uninterrupted succession of towns and large villages, mostly of great antiquity. Villages of 1,000 inhabitants occur almost every mile, and at each valley-mouth stands a town where modern industry has built upon the foundations of prosperity laid in the Middle Ages. Thus Masmünster, Thann, Sennheim (Cernay), Gebweiler, Türkheim, Kaysersberg, Rappoltsweiler, Kestenholz (Châtenois), Barr, Oberehnheim, Rosheim, Molsheim, Wasselnheim, and Maursmünster (Marmoutier) are all wine-growing and in many cases manufacturing towns standing on or under the foothills and, together with their adjacent villages, containing a very considerable percentage—at one time a large majority—of the population of Alsace.

The whole of the 'Gulf of Zabern', that is to say, the

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undulating district round Zabern, extending south to Wasselnheim and north to Wörth, might be considered a part of the foothills, since it, like them, represents an only partially sunk fraction of the Vosges–Black Forest massif, and is not, like the rest of the Rhine plain, covered with Tertiary and Quaternary deposits but still shows Triassic and Jurassic formations at the surface. It seems better, however, in spite of this fact, to attach the Zabern depression to the plain.

The Low Vosges

The upheaval which brought the Vosges–Black Forest massif above the level of the Cretaceous sea was much less pronounced in the north than in the south. In the south, as we have seen, it raised the ancient crystalline mountain system to such a height that denudation has by now removed all the later formations and laid bare original crystalline rocks. But north of the latitude of Strasburg the rise was much less, and in consequence the blanket of Secondary rocks which masked the surface of the ancient mountain system has never yet been removed.

To this fact are due all the topographical differences between the High and Low Vosges. We pointed out how intimately the topography of the former was related to that of the ancient mountain system; in the latter case the ancient mountain system is still buried, and the topography is merely the result of erosion upon a level, or almost level, sandstone plateau.

In consequence there are no great continuous ridges here, as there are in the High Vosges. The structure of the country is determined not by elevations but by depressions: by a series of rivers flowing eastward into the Alsatian plain and dissecting the plateau into confused groups of irregular hills.

These hills are of no great height. In the neighbourhood of Zabern they seldom rise above 450 metres; farther north they sometimes exceed 500, and in the Palatinate they even touch 600 once or twice. But in general the summits stand very little above the level of the adjacent Lorraine plateau, though they overlook the Rhine plain from an escarpment 200–300 metres high, geologically continuous with the eastern limit of the High Vosges and caused by the same system of faults.

The valleys again are totally different in type from the straight, open trough-valleys of the High Vosges. They are

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narrow and tortuous ; there is hardly any flat ground in their bottoms, and they are closely shut in by the steep crags into which the sandstone weathers. Their narrow and winding character makes them bad lines of communication ; but no others are in general available. There are no ridges with easy travelling along the tops, as in the High Vosges. Hence the hills, in spite of their small height, are more formidable barriers to traffic than anything in the higher hills of the south. The reason for this lies in the character of the rock, which is everywhere weathered into vertical and overhanging crags, towers, and pinnacles. Every hill is broken and crowned by these rocks, generally inaccessible and often presenting the most fantastic shapes. The hill ranges of the Low Vosges are thus mostly composed of pyramidal hills crowned with groups of such rocks, the whole smothered in dense forest and in consequence almost impenetrable.

Thus the Low Vosges are a worse country for transit than the High Vosges. Not only is the country extremely difficult to get about in, but the rocks afford an infinite number of natural fortifications which need only slight improvements to convert them into formidable strongholds. The whole Low Vosges district is sprinkled with ancient castles, and its chief towns, Dagsburg (Dabo), Pfalzburg (Phalsbourg), Lützelstein (La Petite Pierre), and Bitsch (Bitche), are natural fortresses of enormous strength from which any one holding the Lorraine plateau can dominate the crossings of the Low Vosges and all the lower Alsatian plain. The history of these fortresses in the Franco-Prussian war, when Bitche made a heroic defence with a scratch garrison, and held out triumphantly to the end of the war, proved both the strength of their positions and the uselessness of holding them so long as the great gap of Kaiserslautern was open to the invader.

The Low Vosges may be taken as beginning with the plateau of Dabo, immediately north of the Schneeberg and Rosskopf. This is a sandstone plateau, densely afforested and furrowed by deep, narrow valleys running north-westward but draining into the Zorn, which flows eastward to Zabern and the Rhine. The Zorn is typical of the Low Vosges rivers ; it flows in a deep, narrow, and tortuous gorge, where all the available space is taken up by the Paris–Strasburg railway, a main road, and the Marne–Rhine canal. These three, debouching into the plain and

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meeting Louis XIV's strategic road from Pfalzburg, make Zabern the vital point it is for traffic.

The unique importance of the Pfalzburg–Zabern road consists in the fact that the Vosges are here at their narrowest. Pfalzburg is practically on the Lorraine plateau; Zabern is absolutely on the Alsatian plain. Yet the two are only 5 miles apart; and for over 3 miles east from Pfalzburg the road still runs level along the plateau, only then reaching the brow from which it plunges to Zabern, the brow from which Louis XIV saw Alsace and exclaimed '*Quel beau jardin!*' There is no other road between Alsace and Lorraine, except the gap of Belfort, that can compare for a moment with the Pfalzburg–Zabern route for ease and shortness..

North of Pfalzburg the Vosges rapidly increase in width. Seven miles farther north Lützelstein with its impregnable rock dominates another fairly good road, and the southern Zinsel and Moder valleys both carry roads leading from the Lorraine plateau to the Rhine plain. North of the Moder lies a trackless tangle of hill and forest about 10 miles square, the Hanauer Wald, at whose north corner Bitche commands an important network of roads. One, with a railway, runs from Bitche down the Falkensteiner Bach to Niederbronn and Hagenau; another cuts diagonally across ridges and valleys due east to Weissenburg. On either side of this latter road the country is very wild and inaccessible, and remains so till the frontier of Alsace is reached. Here, along the tortuous Lauter valley, a road runs up from Weissenburg to Pirmasens and Zweibrücken; another, with a railway, runs up the Queich from Landau; but with these exceptions the Haardt, or Vosges of the Palatinate, is even more impenetrable than the Low Vosges in Alsace.

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CHAPTER II

THE ALSATIAN PLAIN

General Features

The Alsatian plain is a belt of very flat country bounded to west by the Vosges and to east by the Rhine. It is 110 miles long north and south, from the last spurs of the Jura to the provincial boundary marked by the river Lauter; in breadth it varies from 10 miles at narrowest in Upper Alsace to 25 miles in the neighbourhood of Hagenau.

The surface of the plain consists almost entirely of Quaternary formations—river-gravels, loess, and alluvion—overlying Tertiary beds, which appear at the surface here and there; but the character of the Quaternary deposits varies so greatly from place to place as to cause very important topographical and hydrographical distinctions, and so to subdivide the plain into a number of markedly different natural regions.

The most important geographical fact in connexion with Alsace is the distribution of the loess. Where this deposit is present the country is highly fertile, well watered, and densely populated; where it is absent the bare river-gravels and sands are little better than desert. The loess then occurs, first, over a wide area in the Sundgau, the comparatively high-lying region south of Mulhouse; secondly, in a narrow belt extending along the foot of the Vosges as far north as the latitude of Strasburg; thirdly, in a large continuous patch, the Kochersberg, between Strasburg and the Vosges; and fourthly, in a number of large patches farther north, between the river-valleys of the northernmost section of the plain. On the other hand the whole centre and east of the plain from Mulhouse to Strasburg, and the east as far up as Bâle, are free from loess and therefore in great part little better than waste land; and the same is true of large areas in Lower Alsace.

Alsace is thus not a 'Rhine country'. The Rhine nowhere, except at a few places below Strasburg, touches the loess districts; and consequently the life of Alsace has always been

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and must always be aloof from the Rhine. Soon after leaving Alsace, at Spire and Mannheim, the Rhine attracts to itself all the great centres of population; it becomes the *Vater Rhein* of German tradition and song, and maintains that rôle for the rest of its German course. But in Alsace the Rhine is not a thread uniting great towns or even villages; it is not an artery of traffic; it is in no sense the backbone of the country's life. With the sole exception of Strasburg—and that only a partial exception—no Alsatian town touches its banks, and hardly any stand within ten miles of it. Most Alsatians have never seen the Rhine. The life of Alsace—and this fact must never be forgotten in dealing with any Alsatian question—is first and foremost the life of a string of towns disposed in a belt of country only two or three miles wide, following the foot of the Vosges. East of the Ill, Alsace as a political entity is at an end; there is left only waste and arid woodland. This is especially true of Upper Alsace, the richest part of the country; but even in Lower Alsace the belt of country bordering on the Rhine is barren and uninhabited, and the population is practically confined to the loess terraces in the centre and west of the plain.

This fact—the fact that the Vosges foothills, not the Rhine, are the backbone of Alsace—is further accentuated by the character of the Rhine and its banks. If it had been a navigable river, shipping centres would have grown up on its banks, to supply the Alsatian factories with river-borne coal and raw materials and to carry off their products. If it had been easy to cross, bridges would have given rise to traffic-centres beside the river. But the Alsatian Rhine is neither navigable nor easily crossed. It is a river with a steep gradient and a correspondingly rapid current, shallow and swift. Down to Strasburg it is practically unnavigable; and even below Strasburg it is navigable for part of the year only. And on the other hand it is a very formidable obstacle to east-and-west traffic, since it flows not in a simple bed but through a maze of channels, backwaters, and marshes, enclosing numberless swampy islands overgrown with dense vegetation, the whole forming a belt of waterlogged, tangled, and unhealthy country a mile or two wide. The regularization of the channel, undertaken by the French authorities and those of the Grand Duchy of Baden in the middle of the nineteenth century, improved this belt in

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certain ways; it made it less unhealthy and less liable to complete inundation; but it made very little difference to the difficulty of crossing it.

The Ill on the other hand is tolerably navigable for small craft up to Colmar; and therefore a number of towns have grown up along its course.

The city of Strasburg is a very striking instance of the working of the geographical factors which have modelled the whole life of Alsace. The rich loess belt here widens into a large continuous patch, which demands an urban centre on a greater scale than the towns of the southern foothills. Further, a decided drop in the height of the Vosges brings a number of old-established roads across from Lorraine, of which the first and greatest, at Zabern, comes down just here. Thirdly, the Rhine is navigable up to about this point, but no farther. Fourthly, the marshes of the Rhine are here narrow and easy to cross. And fifthly, a valley (the Kinzig), debouching opposite Strasburg into the Baden plain, gives easy access to the interior of the Black Forest and to the Swabian plateau beyond.

Thus Strasburg unites four different advantages. It is the urban centre of the richest part of Alsace; it is the head of Rhine navigation; it is a river-crossing; and it controls the best routes across the Vosges and Black Forest. It is instructive to compare it with the only other easy Rhine-crossing in Alsace, namely Neu Breisach. Here we have not only a crossing, but one well situated with regard to traffic-routes; midway between Colmar and Freiburg, Breisach controls excellent passes both eastward and westward. But it stands in the middle of the most barren region: the country round it is arid gravel and forest; and it has no river-navigation. Consequently it has never become a town. Its importance is strategic only. If the country round it were fertile, it would have become the second city of Alsace.

Even Strasburg, it should be noted, is not a Rhine town. It is an Ill town, like Mulhouse, Colmar, and Schlettstadt. Its growth has brought its eastern edge into contact with the Rhine, but the old city stands definitely on the Ill and away from the unhealthy Rhine marshes.

Thus Alsace is quite singularly cut off from the east. The Alsatian Rhine is one of the most perfect frontiers in Europe.

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On the west Alsace is also protected by the line of the Vosges. But this line is much more permeable than the other. There are only about half-a-dozen bridges across the Rhine between Bâle and Karlsruhe, as against about thirty carriage-road or rail passes over the Vosges. The High Vosges indeed, from the Donon to the Bâlon d'Alsace, present a barrier of considerable and singularly uniform height; but—as has been already pointed out in detail—they are deeply cut into by valleys whose broad and smooth bottoms offer easy going, and at whose heads passes, incomparably easier than any of the Alpine passes, lead over in a few hours to similar valleys on the French side. And the pastures on the summits of the Vosges, to which the herds of both slopes have resorted since time immemorial, have always ensured communication between the population of Alsace and Lorraine. Thus the connexion between Alsace and Lorraine has always been much stronger and more intimate than that between Alsace and Baden. Alsace is a country apart, sheltered both from the east and from the west, and designed by nature to be the seat of an independent, highly individualized civilization; but its westward relations are quite definite and important, its eastern practically non-existent. The Lorrainer is well known and well received in Alsace; the Swabian is the typical stranger and enemy.

But the real traffic-relations of Alsace are northward and southward. The frontier between Alsace and the plain of the Bavarian Palatinate to northward is merely arbitrary, though, if Alsace be defined as the country in which the Rhine divides, instead of uniting, its banks, the frontier must be drawn south of Spire and perhaps south of Germersheim. But so far as north-and-south traffic is concerned Alsace is absolutely continuous with the hinterland of Worms and Mainz, where, however, eastern influences coming across the Rhine definitely take precedence of western influences coming across the mountains. Thus Alsace, isolated in a sense, is yet a high road of international traffic; its isolation can never become stagnation, and it has always been alive to such influences as those which successively made it the chief cradle in German-speaking countries of Romanesque and Gothic architecture and of the Renaissance.

The military aspect of the Rhine frontier is a technical question which it is not proposed to consider here. A few

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historical and topographical points, however, may not be out of place.

The French possession of Strasburg was in 1870 felt as a very formidable menace to Germany. In 1866 Napoleon III had demanded the cession of Mainz; and this gave some colour to the feeling that France stood towards Germany as a probable aggressor.[1] Moreover, it is well known that Bavaria's reluctance to enter the German Empire was increased by the possibility of a French invasion from Strasburg, cutting off Bavaria from Prussia. Thus the acquisition of Strasburg was of twofold importance—military and political—to the project of a German Empire. Whether Germany could on the same grounds justly object to the French recovery of Strasburg to-day would appear to depend on whether she can justly regard France as a probable aggressor.

Some recent writers have asserted that the Alsatian Rhine is a bad defensive frontier for France. It seems, however, open to doubt whether this opinion ought not to be revised. The Rhine is, as we have pointed out above, a peculiarly difficult river to cross; and it has only four railway bridges, two carrying single lines, in 114 miles. Military history would appear to agree with geography in suggesting that a German invasion of Alsace would normally choose to cross the Lauter rather than the Rhine.

In reviewing the geographical features of the Alsatian plain, we are confronted at the outset by the political division into Upper and Lower Alsace. This division does not correspond very precisely with geographical facts; it reflects rather the political distinction between that part of the country which falls naturally within the sphere of Strasburg's influence and the remoter south, which feels less distinctly the attraction of the capital. For the purposes of a geographical description it is perhaps permissible, and would be convenient, to distinguish High Alsace (identical with the political unit of Upper Alsace), Middle Alsace (from the Upper Alsace frontier near Schlettstadt to the latitude of Strasburg), and Low Alsace (north of Strasburg).

[1] 'Southern Germany had been long enough at the mercy of French artillery', says a German historian, H. Oncken (in *Cambridge Modern History* xii. 136), writing of the reasons for the annexation of Alsace-Lorraine, with a one-sided argument typical of German *Tendenzgeschichte*.

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High Alsace

We distinguish by this name the whole of the Alsatian plain lying south of the *Landgraben*, or frontier between the provinces of Upper and Lower Alsace. Setting aside three 'annexes', which will be separately described, viz. the Jurassic districts of Belfort and Ferrette and the uplands of the Sundgau, High Alsace proper consists of an extremely flat plain tilted northwards so that all its watercourses flow north, parallel to the Rhine. There is, it is true, an eastward dip also, but it is negligible compared with the other. In Middle Alsace on the other hand the eastward dip increases and is about equal to the northern, so that the rivers flow diagonally north-eastward, converging on Strasburg; while in Low Alsace the eastward dip predominates, and the rivers flow directly across the plain into the Rhine.

The Outlying Districts

The Ferrette (Pfirt) Region.—This little district is a fraction of the Jura mountain system, attached to Alsace. It is only a few square miles in extent and plays too small a part in Alsace as a whole to call for long description. The justification for the inclusion of this—geologically and topographically—quite un-Alsatian district in Alsace is that it commands an important road running from Bâle through the Gap of Belfort by Montbéliard. This road is the natural line of communication between all the Upper Danube basin and all central and southern France; and, running at the foot of the Jura mountains and being controlled by the three castles of Ferrette, Morimont, and Landskron, it made the possession of these castles a vital matter to any power interested in the communications of the Sundgau and the Gap of Belfort. To-day traffic goes round by Mulhouse and Belfort, and the Ferrette–Montbéliard road has fallen from its former importance; except for the French interest in Ferrette as a historic site there is no reason why the Alsatian Jura should not be united to Switzerland.

The Ferrette Jurassic region is composed of a series of more or less parallel ridges, flat on the top and steep at the sides, like all the ridges of the Jurassic mountain system. The northernmost runs south-west from Ferrette; it is about 2½ miles

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across and very steep on the north face. Its south face is gentler, and falls to the valley of Lüxdorf, in which the Ill rises. South of this valley stands a narrower ridge, less than a mile across, and running east and west. This ridge reaches its highest point at 671 metres, in the Christwald. Southward again, across a very narrow valley, lies the third, last, and highest. This is the Blochmont range, 751 metres high at the Morimont, 811 at the Glasenberg farther east, and then declining to 680 metres at the Blauenberg and 690 at the Nägelberg. This chain again is 2½ miles across. It falls steeply on the south into the Birse valley, which is here the frontier between Alsace and Switzerland.

The formation is limestone of the Upper Jurassic series. It is violently folded, and the deep valleys are due partly to folding, partly to erosion, for the limestone is very porous, and there is a great deal of underground water. Deep gorges are characteristic of this as of other Jurassic regions. The whole area is densely wooded, with open pastures on the summits, scattered with isolated trees.

The Gap of Belfort.—This, though not annexed by Germany in 1871, is part of Alsace, and is as such considered here. It resembles the Ferrette region in being a Jurassic limestone area ; but it differs from it in belonging not to the ' folded ' but to the ' tabular Jura '. The limestone beds, instead of being thrown into violent curves, lie flat but tilted ; they dip south-eastward, and coming to the surface successively produce a series of ridges running north-east and south-west. These ridges dominate the Gap, and it is upon their summits that the forts of Belfort are situated. Between the ridges are flatter deposits of Tertiary and Quaternary gravels.

On the north the Gap of Belfort is bounded by the southern *façade* of the Vosges massif—a face as steep and abrupt as the eastern. The last spurs plunge into the plain and disappear barely 8 miles south of the main summit in this part of the chain, viz. the Bâlon d'Alsace.

The southern limit of the Gap is much less clearly marked. Here the spurs and ridges of the Jura gradually rise from the plain ; the valleys become narrower and more enclosed ; but completely mountainous country is not entered till south of Porrentruy and Pont-de-Roide. North of this, however, is a belt of decidedly hilly country, 8 miles broad, extending to

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Montbéliard and Delle. This reduces the width of the Gap, measured from the last spurs of the Vosges on the north to Montbéliard on the south, to about 14 miles.

Even this fourteen-mile belt, however, the Gap itself, is not level. Flattest in the east, where it merges with the Sundgau and Rhine plain, and composed like them of gravels, its central and western parts are cut up by the Jurassic ridges mentioned above. These form small, irregular hills about 300 ft. in height from base to summit and often steep at the sides. This hilly character culminates in a chain of hills running north-east and south-west, and passing just north of Belfort, where the features of the Jura (narrow ridge, level top, steep sides) are more marked than elsewhere in the Gap.

The precise position of Belfort itself is dictated by this ridge. North of the ridge a tangled cluster of large lakes and swamps fills the whole interval—two to five miles broad—between it and the beginning of the Vosges ; and accordingly the main east-and-west lines of communication must pass south of the ridge. Farther south again is another and larger lake district, extending from Delle in the south to Dammerkirch (Dannemarie) in the north ; and to escape this the main roads avoid crossing the Gap by its southern end. The natural line is therefore that which runs immediately south of the ridge ; and here, at the bridge across the river Savoureuse, lies Belfort.

Belfort is thus not only, with its Jurassic citadel-rock commanding the river-crossing, a natural fortress, but it is also a route-centre of the highest importance. The Paris road reaches it, through a gap in the ridge at Châlonvillars, from the west ; the Lyons road, taking an easy line between the parallel ridges, from the south-west. From the east comes the Bâle road, through Altkirch ; from the north-east the Strasburg—Colmar road. Even for north-and-south traffic Belfort is important. The Savoureuse valley carries a road from Giromagny to Montbéliard, which gives access over the Bâlon d'Alsace to the Moselle valley and Lorraine, and over the passes of the Jura to Switzerland.

Montbéliard is a secondary nucleus of routes crossing the Gap. Traffic on the old road which skirts the foot of the Jura westward from Bâle, the road which the castles of Ferrette, Landskron, and Morimont were designed to guard, might avoid Belfort by passing through Porrentruy and Montbéliard, and

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so westward to Vesoul or south-west to Besançon, Dijon, or Lyons. Thus the possession of Belfort alone does not ensure the command of the Gap ; Montbéliard must also be controlled.

The Sundgau.—The name Sundgau, originally applied (in its natural meaning of 'Southern Region', as opposed to Nordgau) to Upper Alsace generally, has become the specific name of a well-marked district lying south of Mulhouse and north of the Jurassic region of Ferrette. It is a rolling, hilly district sloping to the north and west ; on the north it stands at an average altitude of 260–280 metres, and rises in the south to 420 or 440, with summits exceeding 500 metres. The subsoil is Tertiary, but is overlaid by thick deposits of Quaternary gravels from the Alps, Vosges, and Black Forest, deposited by the rivers of the Glacial period, and a superficial deposit of loess, which lends the district its fertile and well-watered aspect.

The Sundgau is divided by a north-and-south watershed running from its highest point (about midway between Ferrette and Bâle) to Mulhouse. The small area lying east of this line is a rather sharp slope furrowed by numerous parallel, steep-sided valleys in which little rivers run to lose themselves at the foot of the slope in the dry gravels of the Rhine plain. The area lying west of the watershed, the Sundgau proper, is a rolling plateau tilted north-westward, intersected by a series of river-valleys running in the same direction, and bounded by the course of the Larg and Ill, from Dammerkirch to Mulhouse.

The river-valleys of the Sundgau are relics of a bygone geological period. They are too large for the small streams which now wind about their bottoms, and they are cut down to a considerable depth ; the Ill has laid bare the lower Tertiary strata. They were formed by the great rivers of the Glacial period, and flowed north-west to join the Rhine, which then ran through the Gap of Belfort into the Mediterranean. When the Rhine turned northward the Sundgau rivers had to alter their direction ; and from this period dates the elbow made by the Ill at Altkirch.

The Sundgau is very well watered, especially by contrast with the Jurassic district to south and the gravel plain to east. The whole region is seamed with little steep-sided valleys, often dry, but containing much water after rain. The loess and other loamy formations produce a water-bearing stratum at the

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surface, which prevents the absorption of rain-water; and where this stratum is broken through and the surface water can escape, there is a good deal of underground water in the underlying gravel.

A singular feature of the Sundgau is its lakes. These number some hundreds, but are very small; they are confined to the south-west of the district, and extend over the French frontier. A physical description of these lakes is given below, in Chapter IV.

It should be observed that the lakes of the Belfort (Savoureuse valley) district are quite different in character and origin.

The Rhine Plain Proper

The true plain begins north of the Doller from the Vosges to Mulhouse, and east of the line, running south-south-east from Mulhouse towards Bâle, which marks the foot of the slope that limits the Sundgau in that direction.

This section of the Rhine plain, between these limits on the south and the *Landgraben* on the north, is the most level part of Alsace. Between the Ill and the Rhine is a strip of country 7 to 9 miles wide which, measured from the bank of the Ill to the terrace overlooking the marshes and channels of the Rhine, is dead level east and west, while from south to north it has a very slight slope, amounting to 1 in 750 in the south at Mulhouse, and 1 in 1000 in the north at Schlettstadt. The whole of this area is entirely free from any kind of hills, and the only slopes are caused by shallow watercourses.

West of the Ill the plain has a slight but quite perceptible eastward slope. This section narrows northward from about 9 miles across at Mulhouse, with an eastward slope of 1 in 150, to 3 miles at Schlettstadt, with about the same slope or rather less. It is this eastward-sloping section of the plain between the Ill and the Vosges, together with the foothills of the Vosges themselves, that constitutes the rich and fertile Alsace of history.

The plain of High Alsace falls into three sharply distinguished types of country, according as the soil is diluvial, alluvial, or loess. The diluvial formations—i.e. the ancient river-gravels—extend over almost the whole of the plain between the Rhine and the Ill. Here they form the *Hart*, a forest reaching from the outskirts of Bâle in the south in a continuous belt past

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Mulhouse to beyond Ensisheim and in scattered patches to Markolsheim—a total length of some 40 miles, with a greatest breadth, near Mulhouse, of 4½ miles. The continuous belt is about 35 square miles in area. This forest, with much of the surrounding country, to which the name Hart might not illegitimately be extended, is formed of Rhine gravel, with hardly any surface soil at all. Water disappears below the surface, which is in consequence always dry; and at a shallow depth the gravel generally binds into conglomerate. A less fertile soil could hardly be imagined. Attempts to convert the Hart into pasture have proved a complete failure. Even as forest it is very bad; the trees are stunted and miserable, and amount to little more than oak scrub, from which poles are cut for vine-props. By the time the trees have grown old enough for this purpose, however, they are generally rotten. The only thing that preserves vegetation alive is the underground water, which, flowing through the lower strata of gravel, prevents the upper strata from becoming absolutely arid. The northern extremity, towards Schlettstadt, is much less wooded and more fertile; in fact it contains much fairly good agricultural land.

The Hart district terminates eastward in a terrace some 20 ft. high, along the edge of which runs the Bâle–Strasburg road. Below the terrace is a second terrace or shelf, also of gravel, on which, profiting by the possibility of tapping the underground water at this level, a string of small villages have arisen. These are not Rhine villages; they are built not on the river but on the terrace overlooking it, and depend for their existence quite as much on the traffic of the road, and the forests and fields of the Hart plain, as on the resources of the Rhine.

This intermediate shelf drops by a second little escarpment into the Rheinwald, the belt of channels and islands through the middle of which runs the artificial bed of the Rhine. This is an alluvial region; the river has overlaid its old gravels with sand and mud, on which a rich marsh vegetation has arisen. The islands are heavily wooded with a type of forest totally different from the sparse, dry scrub of the Hart. The islands (known as Ried or Grün) have now been largely brought under cultivation, and the whole Rheinwald is rich in game and rare birds. Gold-washing was once carried on in the sand; but this industry is now extinct. The river is rich in fish, and the

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salmon-fishery is a source of wealth to the neighbouring villages.

Westward the Hart is limited by the alluvial belt of clay and loam soils in which flows the Ill. This belt is insignificant in the south ; but in the north it expands into the Ried, a marshy plain intersected by numerous watercourses or dykes (*Gräben*) and extending from Colmar to Schlettstadt. The Ried is mostly free from trees, and comprises a large area of rich meadows and good arable. At the northern end, close to Schlettstadt, the Ried changes its character ; open pastoral and agricultural land gives place to a dense forest about 2 by 4 miles in extent, and known as the Illwald.

The plain between the Vosges and the Ill is a good deal narrower than that between the Ill and the Rhine, but it is in every way more important. It is composed of diluvial gravels from the Vosges ; and where these are left bare they are no less arid and sterile than the gravels of the Rhine. This is especially the case in the Ochsenfeld, the southernmost section of the plain, between the Doller and Thur. The Ochsenfeld is a flat plain composed of Vosges débris brought down by the Thur. It is in fact the old delta of the Thur, and spreads out fanwise eastward and south-eastward from Thann as an apex. It is waterless, uninhabited, and almost devoid of vegetation, and is as complete a desert as any part of the Hart. Attempts have been made to bring a small portion of its northern edge under cultivation ; but the extent of these has been small. They have, however, demonstrated that proper irrigation can turn selected portions of the Ochsenfeld into pasture.

Eastward the open, treeless Ochsenfeld passes into the almost equally arid and uninhabited Nonnenbruch Forest. This occupies all the remaining, or eastern, portion of the area between the Doller and Thur to south and north and the alluvial belt of the Ill to east. The Ochsenfeld and the Nonnenbruch Forest together form about 60 square miles of waste. Here, as in the Hart, the woods are of little value in proportion to their area ; the trees are sparse and ill-grown, and the gravel, binding below the surface into conglomerate, prevents their roots from penetrating to the subterranean water-bearing stratum. The only value of this region, and that a very high value, is derived from the potash deposits which underlie it.

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The rest of the Vosges–Ill plain is for the most part covered either with loess or with other good soils. The loess extends along the foot of the Vosges and occurs in isolated patches in the plain. The cultivated fields run right up to the foothills of the Vosges, which spring abruptly at a steep angle from the flat plain, and stretch away for some miles eastward among the compact and frequent villages till they merge in the pastures of the Ried. For the most part this district is too dry and too valuable to permit the growth of timber; but woods exist here and there, notably the Thurwald, which follows the old bed of the Thur from Rufach to Colmar. Similar woods exist along the Fecht, and at the junction of the Fecht and Ill, near Gemar, the Niederwald occupies two or three square miles.

The distribution of population in the plain of High Alsace is very simple. First comes the line of little towns and large villages along the edge of the foothills, an unbroken belt of dense population: then frequent villages scattered in the fields as far as the Ill. Along the Ill is strung a series of towns, large but well spaced out and occupying the important points, i.e. the crossings and confluences. Then comes the very sparsely inhabited Hart country; and then the belt of small villages along the Rhine terrace. The population is everywhere concentrated in compact villages; isolated farms are nowhere found. On average the population is decidedly dense.

Middle Alsace

We distinguish by this name (see p. 43) the district between Schlettstadt and Strasburg—a district which falls within the political unit of Lower Alsace, but is in physical character a continuation of Upper Alsace. It can be analysed into the same component features as the latter: to east, the Rheinwald; then the inhabited lower terrace, followed by the level plain of arid Rhine diluvium; then the alluvial ground, marshy and forest-grown, of the Ill; then the western plain, fertile and densely inhabited, rising to the foothills.

On the other hand a few differences from High Alsace must be observed. The Ill runs diagonally from Schlettstadt to Strasburg, and in consequence the eastern (or Hart) plain, here tolerably fertile, tapers off to a point and disappears altogether near Erstein, where the Ill alluvia meet those of the Rhine; for the same reason the western plain widens to the north till

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from 3 miles at Schlettstadt it has become about 12 miles wide between Molsheim and Strasburg. The belt of country along the left bank of the Ill is dry and gravelly; along its centre runs the Colmar–Strasburg railway. North-west of this comes a wet [1] alluvial belt, a waste marsh till 1887, now containing meadows and woods, and traversed by the Scheer, Andlau, and other streams flowing parallel to the Ill, together with numerous drainage-canals; and after this comes a broad flat plain consisting of good agricultural land dotted with large villages and extending from Barr on the south to Molsheim and Strasburg on the north.

The population of Middle Alsace is grouped: (1) densely along the foothills, especially in the towns of Molsheim, Rosheim, Oberehnheim (Obernai), and Barr; (2) somewhat densely in the plain between Barr and Strasburg, in large villages; then follows an uninhabited belt, the woods and meadows of the Andlau; (3) in the towns (Erstein, Benfeld) and villages which line the dry left bank of the Ill, following the course of the road and railway; another wet and wooded strip, the northern continuation of the Illwald, follows; (4) a few scattered villages in the Rhine–Ill plain, the northern continuation of the Hart; and (5) the line of villages following the Bâle–Strasburg road along the Rhine terrace.

Low Alsace

We apply this name (see p. 43) to that part of the Alsatian plain which lies north of Strasburg. Strictly speaking, the Breusch from Molsheim to Strasburg is the boundary between Middle and Low Alsace. South of the Breusch the whole plain is intensely flat and composed of diluvial gravel, overlaid by loess on the extreme west and in other places by alluvial deposits causing marshy ground. North of the Breusch the plain is mostly undulating, broken into very gentle ridges and valleys, and covered with much more extensive and continuous deposits of loess. The fertile areas are in consequence much larger. There are desert areas, but these are mostly not gravel but sand; they are very flat and quite free from undulations. The sand is not always barren; when well watered. it may prove a decidedly fertile soil.

[1] Like the marshes of the middle Ill, this alluvial region is known as the *Ried*.

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The Low Alsace plain is much broader than that of High and Middle Alsace. Immediately north of Strasburg it widens, the Vosges retreating westward to form an indentation known as the Gulf of Zabern, and the Rhine at the same time bending eastward. Thus the plain attains a width of 25 miles measured through Buchsweiler and Brumath—a maximum which, however, begins at once to diminish till at Weissenburg a kind of bottle-neck is formed between the Vosges and Rhine measuring only 12 miles across.

The sandy and uninhabited areas are three in number. They are shaped like triangular gulfs running up from the Rhine into the undulating, loess-covered plain, and are in fact the deltas of rivers flowing down from the sandstone Vosges. The first, the delta of the Zorn, lies immediately north of Strasburg. It extends north to Brumath and consists largely of woodland (*Herrenwald*). It is almost entirely uninhabited; the Marne–Rhine canal and a line of villages run along its south-western edge.

The second sandy area is the Hagenau Forest, over 50 square miles in extent. This is a vast delta deposited by the streams which converge into the Moder and Sauer, and extends in a broad belt from the Rhine very nearly to the Vosges. In the Middle Ages the continuity was complete; there is now a gap along the foot of the Vosges. The Hagenau Forest is so formidable an obstacle to traffic, from its extent and density, that this gap is a most important link in the communications of the region; it is in fact the gate of Low Alsace, and the battle of Wörth (Aug. 6, 1870) was fought for its possession. The forest is quite flat and uninhabited; its sandy soil is intersected by numerous streamlets all flowing eastward. At Selz the forest touches the bank of the Rhine.

The third of these sandy districts, the Bienwald, is the delta of the Lauter. It closely resembles the forest of Hagenau in general characteristics. It is flat, sandy, and uninhabited, and in size about equal to the forest of Hagenau; it stops short of the Vosges, leaving a narrow gap in which stands Weissenburg (Wissembourg) on the crossing of the Lauter. But only a small fraction of the Bienwald falls south of the Lauter and therefore within Alsace.

The undulating and fertile plain occupies the whole Gulf of Zabern, and pushes eastward in three promontories separated

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by the low-lying sandy forests just described. The southernmost section of this area, lying between the Breusch and the Zorn, is called the Kochersberg. Originally the name belonged to the geographical and political centre of the region, a hill 285 metres high on which stood the castle of the bishops of Strasburg, who controlled from this centre their surrounding domains. Hence it was extended to serve as a designation for the whole area of rolling loess-covered country between Zabern and Strasburg and between Brumath and Molsheim. To west the Kochersberg abuts on the Vosges; to east it juts out in a promontory (bounded northward by the sandy delta of the Zorn and southward by the marshes of the Ill) to the outskirts of Strasburg. It thus carries the Zabern–Strasburg road over high and dry ground to the very bank of the Ill, and at the same time increases the importance of Strasburg by making it the centre of a rich agricultural district. For the Kochersberg is, to judge at once by intensity and extension, the agricultural centre of Alsace. Other areas, in the southern foothills, are as fertile, or even more so; but there is nowhere else so large an area of such fertile soil. Every kind of crop grows well on the loess; the south-facing slopes are used as vineyards, the rest as arable; the whole is densely sprinkled with compact villages, small but very close together; communications are good, and agricultural work easy, since the loess never gets sodden with water like a clayey soil. Thus the Kochersberg is a prosperous district in which an exclusively agricultural population has kept up to an unusual degree the sense of a corporate life and the traditions of an old-established culture.

The second section of the fertile plain includes to westward the rest of the Gulf of Zabern and projects eastward into a promontory between the Zorn and the Moder. It includes a number of small country towns, Ingweiler and Buchsweiler, Hochfelden and Brumath, and the larger towns of Bischweiler and Hagenau. All these depend for their subsistence primarily on agriculture and the industries to which it gives rise. Here too the country is undulating, the soil rich, and the population, distributed in small and frequent villages, hardly less dense than that of the Kochersberg.

The third section extends from the Hagenau Forest to the Bienwald. Unlike the preceding sections, it reaches right

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across the plain from Niederbronn and Weissenburg under the Vosges to Lauterburg and Selz on the Rhine. Here again there are several small country towns, separated by rolling, fertile country studded with villages; but to east and north-east the country becomes less fertile and more sparsely inhabited; and in the neighbourhood of Wörth and Sulz-unter-Wald it has been invaded by industry in the form of pumping-stations, refineries, and other establishments exploiting the oil-bearing Tertiary strata which underlie the loess.

The river-valleys of Low Alsace differ in character from the undulating loess plains on either hand. They are broad and flat, and their alluvial bottoms are covered with green meadows; the sides are steep, though not high (seldom over 100 feet), and are generally planted with hops.

Thus Low Alsace has in general a character and aspect differing rather noticeably from that of High and Middle Alsace. Instead of a flat plain, here gravelly and waterless, sometimes bare, sometimes covered with a thin scrub, there marshy and covered with meadows or forest, there again very fertile and intensively cultivated for small stretches together, Low Alsace presents a wide expanse of undulating country, all well populated and well watered, green and prosperous in aspect, and interrupted only by stretches of rich, dense forest whose well-watered sandy soil produces a vegetation very different from the sparse and ill-grown timber of the High Alsatian gravels. The contrast has been expressed by saying that Low Alsace is typically North European; High Alsace, with its alternation of desert and intensive cultivation, its treelessness and lack of green, belongs to the south.

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CHAPTER III

THE LORRAINE PLATEAU

General Features

Lorraine, as a geographical district, may be defined as a plateau averaging about 300 metres above sea-level, sharply distinguished by its altitude from the lower plains of Champagne on the west and Burgundy on the south, and from the higher hill districts of the Ardennes to north and the Vosges to east.

The great plain of northern France, known to geographers as the 'Paris basin', consists of a number of geological strata arranged like a nest of saucers of graduated size, Paris lying in the centre of the uppermost and smallest saucer. The successive strata thus come to the surface in concentric circles, the oldest being outermost; each, as it crops out, gives rise to an abrupt escarpment facing away from Paris and a gentle slope facing in the opposite direction.

Lorraine falls within the Paris basin, and therefore consists of gently sloping terraces, each successively broken away in an escarpment facing away from Paris (eastward), and all arranged in a series of concentric curves. It is this series of terraces and scarps that makes Lorraine a natural defence for the heart of France from attacks from the east.

But Lorraine, though geologically it falls within the Paris basin, as is shown by its concentric 'aureoles' (as French geographers call them), falls in a sense outside it. Its altitude, as we observed, differentiates it from the lower lands of the Parisian plain; and its hydrography differentiates it even more clearly. Whereas the Parisian plain is drained by a system of rivers debouching into the Seine and radiating from Paris in all directions, the rivers of Lorraine flow north to join the Rhine. Its chief rivers are the Meuse, which cuts through the Ardennes to traverse the Belgian plain and meet the Rhine at its mouth, and the Moselle, which forces its way between the Eifel and Hunsrück hill systems to enter the Rhine at Coblenz.

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Only the extreme western and southern margins of Lorraine are drained by tributaries of the Seine and Saône respectively.

Lorraine is thus marked out by geography as a debatable land. Geologically it is entirely French. But its hydrography attaches it to the Rhinelands, and its topography gives it a considerable degree of independence, separating it alike from northern and southern France, from Belgium, and from Alsace by means of mountain barriers or more or less abrupt changes of level. It is not surprising in view of these geographical conditions that Lorraine should be a country with a fundamentally French population, affected on the east by infiltrations of Germanic origin; that its political history should connect it strongly with France but also to a less extent with Germany; and that for a long time it should have been the seat of a powerful and autonomous State under the independent dukes of Lorraine.

The plateau as a whole shows a fairly homogeneous character. Its altitude is sufficiently uniform to give it a uniform climate: rainy, because the moisture-laden west winds which pass uninterrupted over the Parisian plain are first broken by its western heights; approaching the continental type because of its distance from the sea and nearness to the centre of Europe, and therefore subject to greater extremes of heat and cold than the most part of France. Partly to this climate, partly to the soil is due one of its most striking features, the very large area of forest; also the lowness, except where industry has augmented it, of the population, whose concentration in compact villages may be ascribed both to the political history of the country—a border-land in which isolated houses have always been less safe than villages—and to the agricultural system which has sprung up out of the soil. Lorraine is everywhere an agricultural country except in the north, which immensely rich deposits of iron-ore have converted into a great mining area; the industries of the south belong rather to the Vosges than to the plateau.

But within this homogeneous region a number of subdivisions may be recognized. Each outcropping stratum differs geologically from its neighbours, and has a resulting individuality of its own, topographical and economic. These subdivisions, in consequence of the general arrangement of the Paris basin, take the form of belts extending from north to south in a curve

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whose convex side faces eastward; they are in fact arcs of the circles which form the concentric 'aureoles' of the Paris basin.

It is convenient to recognize two main divisions. Western Lorraine is composed of Jurassic formations, oolitic limestones like those of Portland, Bath, the Cotswolds, &c., with beds of clay between them; eastern Lorraine of Triassic, i. e. marls above (to westward), limestone in the middle, and red sandstone below, the last cropping out on the east and forming the transition to the Vosges. Jurassic Lorraine consists of alternate belts of oolite and clay, the former making hill ranges like the Cotswolds or Edgehill, the latter forming plains like that of Oxfordshire. The hills are dry, barren, seamed by deep watercourses and heavily timbered; the plains are flat and wet, good agricultural land and therefore cleared of forest, but heavy to work and alternately muddy in winter and hard in summer. Triassic Lorraine on the other hand consists of a broad marly plain on the east, with a rich soil resembling that of the Jurassic clay belts, passing over into sandstone mountains, the foothills of the Vosges, on the east. Each of these subdivisions forms a *pays* with a well-marked unity for geography, and in many cases for political history as well; and our detailed study of the geography of the Lorraine plateau will consist of a review of these *pays* in the groups to which their physical characteristics assign them.

The western frontier of Lorraine may be taken as coinciding with the line of division between the Cretaceous and Jurassic formations. This leaves the Barrois on the south, and the districts immediately west of the Meuse about Verdun on the north, inside Lorraine; the *Champagne humide* on the south, and the Forest of Argonne on the north (both composed of grits and clays belonging to the Cretaceous) outside. The Forest of Argonne, as a hill district densely covered with forest, might seem more allied in character to Lorraine than to Champagne; but it is most convenient to exclude it from our area.

The Western Marginal Districts

The uppermost stratum of the Jurassic is the Portland oolite, which in the south forms the Barrois plateau, narrowing in the north to a mere tongue of limestone country bordering on the gault of the Forest of Argonne. The Barrois is an arid lime-

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stone plateau intersected by deep and narrow gorges, through which its rivers, the Saulx and Ornain, escape to the lower-lying Cretaceous plain of Champagne. It is continuous to south-west with a succession of similar plateaux running in the direction of Bourges. The points at which the rivers of the Paris basin, after cutting through these plateaux, emerge on the open country of the plain are frequently distinguished by the name Bar; thus we find Bar-le-Duc, the capital of the Barrois, and farther south-west Bar-sur-Aube, Bar-sur-Seine. The Portland stone of which the plateau is composed has a number of distinct beds of very different character: oolite, porous limestone, lithographic stone, &c. On the west the Barrois passes over through a broad transitional belt, where gault and limestones alternate, into Champagne; but a kind of natural frontier exists in a depression running down the Marne from Joinville to Fontaine, and then continuing straight on to strike the Ornain at Revigny. This depression is due to a fault which contains a succession of springs and mineral deposits (phosphates, iron-ore, sands), upon which industries have grown up. West of this the country is low: the average altitude is below 200 metres, declining through a belt of forest to about 150 and less in the waterlogged *Champagne humide*, whereas the Barrois, at about 300 metres, stands already at the general elevation of the Lorraine plateau. The trough in question forms a drop of about 100 metres.

The general slope of the Barrois is towards the north and north-west. The Portland beds are broken off to eastward by an escarpment about 100 metres high, beyond which is a narrow belt of Kimmeridge clay forming the little districts of Ornois and Blois, to be described below. The maximum altitude on the summit of the escarpment is 414 metres.

The comparative thinness of the Portland beds gives rise to a peculiarity of the Barrois topography, viz. the combination of limestone (Portland) plateaux with clay (Kimmeridge) valley-bottoms. Almost all the watercourses are cut down far enough to reach the clay, where they tap water-bearing strata and contain sluggish streams, fed by springs, which often rise in caves at the sides of the valleys. The streams which flow over the limestone are rapid and intermittent, flowing at varying intervals after heavy rain. The villages occur in the valley-bottoms, with the exception of some

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which have established themselves on the dry plateau for the sake of proximity to their quarries ; for all the various Portland beds are workable, and many give valuable stones for building, lithography, and other purposes. Every village has its quarry, and the houses are in consequence solid stone buildings, much superior to the average Lorraine house. Cavities in the limestone here and there contain geodic iron-ore, sometimes in large quantities, which gave rise to an early and flourishing industry when coupled with the fuel-supply obtained from the wooded plateaux.

The forests are still an important source of wealth in the Barrois. Oak and beech flourish both on the Cretaceous and the Portland, and there is a considerable export of tanning bark, timber, and especially firewood. The country is also rich agriculturally : cereals, roots, potatoes, forage, and industrial plants grow well in rotation, and fallow is unknown. The vine grows well on the warm limestone slopes, but in the latter half of the nineteenth century it declined seriously, owing to disease and to labour difficulties. It is still, however, among the chief resources of the district. The best arable is found on the Portland beds in the north ; the Cretaceous islands which occur on the plateau are almost always wooded. Live-stock of all kinds flourishes ; there are large flocks of sheep and herds of swine ; and bee-keeping is well understood.

The Ornois and Blois are two tiny districts on the eastern edge of the Barrois, which together make up the Kimmeridge clay plain overlooked by the limestone escarpment of that district. They are terminated to eastward by a much lower escarpment parallel to that of the Barrois limestone. The surface of this region is accidented : the rain, penetrating the limestone caps of the hills and moistening the underlying clay, produces landslides when the latter becomes sufficiently soft. The same cause produces an abundance of springs, and the district has much surface water. A number of limestone buttresses project eastward into this region from the Barrois ; the most conspicuous is the hill of Delouze, which divides the Ornois on the south from the Blois on the north.

North of the Blois the Kimmeridge strip continues, always running parallel to the Barrois escarpment, till it practically disappears near the source of the Aire. The whole Kimmeridge region is poor both in stone and in timber. The villages are

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numerous and closely grouped together; the economy of the country is wholly agricultural, and there are no towns.

Below the Kimmeridge clay lies the so-called Astartian limestone, which forms a north-and-south belt comprising (from south to north) the Bassigny, Vaux, Voide, Verdunois, and Clermontois.

The Bassigny (distinguish from the other Bassigny farther south, capital Chaumont) extends from the neighbourhood of Gondrecourt, its chief town, south-eastward to the scarp which overlooks the Saônelle river and the basin in which Neufchâteau lies. It contains the head-waters of the Ornain, and consists of a high plateau dominating the lower country on either hand. It contains some timber and makes tiles; but its chief resource is agriculture, and it has some export of oats and potatoes.

The Pays des Vaux adjoins the Bassigny to northward. As its name suggests, it is a limestone country, traversed by conspicuous ravines. The villages mostly overlook the Meuse, by which it is bounded to east. The Vaux contains much forest, and the population is low.

The Voide (pays de Void) is a tiny district, densely overgrown with timber and containing hardly any population at all apart from the one town of Void in the Meuse valley. The district extends up the Meuse to Vaucouleurs, where the Vaux may be said to begin.

The distinction between the Bassigny, Vaux, and Voide is purely conventional; they form geographically a single homogeneous unit of somewhat barren and dry country (especially in the north) heavily timbered and thinly populated.

North of Commercy begins the Verdunois, a vaguely defined territory consisting of a three-mile belt of hilly and wooded country, bordering on the left bank of the Meuse. Apart from villages in the Meuse valley, it is almost uninhabited. On the north it passes into the Clermontois. The Argonne and Dormois are gault districts, and as such lie outside Lorraine, whose boundary may be defined as the Andon, a left-bank tributary of the Meuse separating the Dormois from the Clermontois, and a line of villages—Esnes, Malancourt, Bantheville, Romagne-sous-Montfaucon—near the watershed which here divides the Meuse and the Aire. Practically the whole drainage-area of the latter river thus falls outside Lorraine.

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The Meuse Valley

The Meuse, from its sources in the south to the neighbourhood of Stenay, is one of the two chief rivers of Lorraine. Its rôle is, however, singularly restricted by the fact that after its formation near Neufchâteau it receives hardly a single tributary worthy of the name. This long straight valley, tangential to the outcrop of the Astartian in the north, diverges from it in the south and cuts successively across the remaining Jurassic strata. Thus the head-waters of the Meuse drain the Liassic plain in the extreme south of Lorraine and, converging on Neufchâteau, pass successively through the Bajocian and Bathonian oolite escarpments in gorges, emerging at Neufchâteau in an open basin floored by the Oxford clay.

Here the valley of the Meuse begins. Below this point it runs with a fairly straight general direction at first north for 25 miles to Pagny and then north-north-west for nearly 70 miles to Stenay; but in detail the course of the river is twisted into innumerable loops and meanders; it often has backwaters and alternative channels; and the banks show everywhere traces of old deserted loops. These often appear at a considerable elevation above the present river-bed.

The valley is cut through the Corallian oolite for the whole distance between Neufchâteau and Stenay; but it is possible to distinguish a number of sections more or less clearly marked. At intervals the river has to penetrate a more than usually hard bed of rock, which throws a barrier across the valley and forces the river into an especially noticeable loop. Such loops occur, for instance, at St. Mihiel and Cumières, above and below Verdun. The intermediate portion of the valley between two such rock-barriers forms in each case a relatively independent section of the valley, having its own capital and in many cases an independent part of no small importance in the history of Lorraine.

Reviewing the valley from south to north, the first of these basins is that of Neufchâteau, between the point at which the river leaves the Bathonian oolite and that at which it enters the Corallian at Coussey. The Neufchâteau basin is thus as it were an annexe of the Woëvre (the clay plain intermediate between the Bathonian and the Corallian; see below, p. 67), and the town owes much of its importance to this fact, since the clay plain, here obliquely crossing the Meuse, is the natural

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route from Toul, Nancy, and Metz south-westward to Langres or Chaumont-en-Bassigny and beyond. Thus Neufchâteau was early an important trading centre.

The second basin is that of Domrémy, which extends from Coussey to Pagny-la-Blanche-Côte. This basin, shut in to westward by the wild and wooded plateau of the Vaux, and hardly connected with the outer world except by a defile through the Côtes de Meuse eastward to the Toul–Neufchâteau road on the Woëvre, contains no town ; but owes its fame to the existence here of Domrémy, birthplace of Jeanne d'Arc.

Below Pagny-la-Blanche-Côte begins the third basin, which resembles the second in size and characteristics, but contains a small town, Vaucouleurs, conditioned by the rather important twin defiles of Blénod-lès-Toul and the Colombey, communicating with the Woëvre.

The fourth basin, from St. Germain to Void, contains a highly important strategic centre at Pagny (or Pagny-sur-Meuse ; distinguish Pagny-la-Blanche-Côte, above, and Pagny-sur-Moselle, on the Franco-German frontier below Pont-à-Mousson), where the Pass of Toul joins the Moselle and Meuse valleys. This is the most important of the gateways between central Lorraine and France proper, a fact reflected in the military importance of Toul, the pivot of the eastern defence of France. The Pass of Toul is to the western frontier of Lorraine what the Pass of Zabern is to its eastern (see p. 38). Accordingly this section of the Meuse contains a number of flourishing villages, called into existence by the traffic through the pass.

Between Void and St. Mihiel comes the Commercy basin, whose centre, Commercy, was long an independent State, rich in its small way but lying outside trade-routes and never rising to any considerable eminence, isolated as it was by the forests of the Verdunois to westward and the lakes of the Woëvre to eastward. The rich meadows and good stone of the river-valley and hill-side were its sole resources. Now, however, Commercy is a station on the Paris–Strasburg main line, and the stone-quarries have expanded into a large export industry.

St. Mihiel has no basin of its own. It lies on one of the rock-barriers of the valley between the Commercy and Verdun basins ; but it owes its position as a town to a good pass through the uninhabited Verdunois forests at Fresnes-au-Mont, which carries a road from Bar-le-Duc to Pont-à-Mousson.

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The Verdun basin begins at St. Mihiel. It is large and broad, rich in agricultural produce and building-stone, well supplied with timber on both sides, furnished with easy internal communications and also with east-and-west roads through the Verdunois and the Côtes de Meuse, and, lastly, provided with a natural acropolis in the rock of Verdun. These natural advantages early raised Verdun (already a centre and fortress in the pre-Roman period) to a position never challenged by any other town of the Meuse valley. Industries, drawing their raw material from the forests, arose; the road from Rheims to Metz brought a large traffic; and Verdun became one of the chief towns of Lorraine.

A seventh and last basin may be distinguished as beginning at Cumières and extending to the point at which the river emerges from its narrow limestone valley at Dun. Here the right bank alone is Corallian, the left bank is Astartian, with gradually increasing occurrences of gault and greensand (the Clermontois). Finally at Dun the Dormois, a gault district, and no part of Lorraine, appears on the left bank; on the right the limestone *côtes* disappear, and the clay plain of the Woëvre reaches the river-bank.

The whole valley is very homogeneous in character. The alternation of barriers and basins is very regular. There are nowhere tributaries, except very small streams. The river winds through a continuous series of rich meadows, which it floods from time to time, swampy here, dry and gravelly there. The canal and railway bring a certain amount of traffic, but not much; and the population, never very high, is declining. In fact the geological history of the Meuse seems curiously parallel to its political history. It is an ancient river, whose valley dates back well into the Tertiary period; but its passage through the hard rocks of the Ardennes retards its rate of erosion, and its valley is in consequence suspended, so to speak, at a higher level than those of its neighbours. These, with a more rapid rate of erosion, have deprived it one by one of its tributaries. The upper Moselle, which once flowed in by the Pass of Toul, has been captured by the lower Moselle; the Madon and the waters of the Woëvre have gone to swell the same river, with the exception of a few streams in the northern Woëvre which have not yet gone. On the west the Aire has been captured by the Aisne, while the rivers of the Paris basin

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are eating their way closer and closer to the Meuse's left bank. And on the south the head-waters of the Saône, cutting back through the Faucilles, are abbreviating little by little its sources. The Meuse is a survival from an earlier age, destined in a comparatively short period of geological time to disappear, its waters divided between the more active systems of the Seine, Moselle, and Rhône.

In the same way the political life of the Meuse valley seems to be undergoing an inevitable decay. Its traffic and industries are being diverted to districts whose geographical position and relations enable them to use a dense population to better advantage, such as the regions centring round Metz and Nancy. The parallel is not merely fanciful; for it was precisely the vicissitudes of geological history which, before the beginnings of mankind, foredoomed to failure the political and economic life of the Meuse by intercepting its tributaries, diverting its water-supply, and isolating its valley from the rest of the world.

The Côtes de Meuse (Corallian Terrace)

The next series below the Astartian is the Corallian or coral-rag oolite, a thick stratum of light-coloured porous limestone. This forms one of the most prominent topographical features of Lorraine, namely the Côtes de Meuse, a range of hills, remarkably continuous and uniform, stretching from Neufchâteau in the south to Dun in the north, a distance of 85 miles, along the right bank of the river.

This range is an element of the highest importance in the eastward defences of France. Its history during the war is significant in this connexion; it will be remembered that the Germans early succeeded in piercing its centre at St. Mihiel, but were never able to make the smallest use of their success; that the southward stroke of the Crown Prince through the Argonne in 1914 was a second and equally unsuccessful attempt to overcome the same obstacle, this time by turning it; and that finally a frontal attack—a last desperate expedient—resulted in the great failure of the Verdun offensive. Under these tests the Côtes de Meuse proved impregnable.

Towards its southern end the range is pierced by a number of passes. The Ruppes valley, debouching in the Domrémy basin of the Meuse valley, is the southernmost; the Colombey

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and Blénod-lès-Toul valleys, converging on Vaucouleurs, follow; next comes the most important of all, the Pass of Toul, with which converges a minor defile from the north-east, the Pass of Trondes. Three passes, those of Jouy, Boncourt, and Marbotte, lead into the Commercy basin; the last, that of Creue, reaches the valley just below St. Mihiel.

Between these passes, and in the unbroken range which stretches north from Creue to Dun, the character of the Côtes is very uniform. They are steep, compact, and scored by ravines; covered with dense forest, waterless and barren. Almost uninhabited, except for villages in the deep valleys which subsist on such industries as the manufacture of furniture, sabots, and brushes from their local timber, or the weaving of baskets from the osiers that grow in the swampy valley-bottoms, their arid and sterile soil is hardly anywhere cultivated, and very few crops yield a profitable return. The deeper valleys, such as the defiles above enumerated, are cut down through the whole of the Corallian strata to the clay below, and thus present a marked contrast with the intervening hills; they have streams and meadows, an abundance of water, and a fair population. Between Creue and Dun there are many such valleys, but they are mere *culs-de-sac* debouching westward on the Meuse, and do not communicate eastward with the Woëvre.

The summit of the range is fairly level. Indeed it is really no more than a strip cut off the edge of a continuous and level plateau by the erosive action of the Meuse, which has driven its valley through the Corallian massif parallel to the escarpment which bounds it. This plateau would, if the Meuse valley did not exist, form another terrace like the Barrois plateau on the west and the Briey plateau on the east. Like these, it would rise very gently and uniformly eastward and then terminate in an abrupt scarp. As it is, the regularity of this topography has been interrupted by the Meuse, which has shorn the Corallian terrace in two and given to its eastern part, the Côtes de Meuse, the appearance of an independent range of flat-topped hills. The highest points of this range, as one would expect, all lie on its eastern edge. They oscillate round 390 metres, exceeding 400 metres only south of the Pass of Toul, with the exception of two isolated instances near Creue and Dun respectively.

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The Woëvre (Oxford Clay Plain)

The name Woëvre (pronounced as if written *Ouavre*) is very common, under various spellings, in the whole of Lorraine, and also in the south of Belgium. Scores of woods in this region are called Bois de la Voivre. The word is derived from the Low Latin *wabra*, 'brushwood' or 'thicket,' and is merely a local word for small timber. The spelling Woëvre, however, is used of one district only, and that a district which is by now conspicuously free from forest, namely, the clay plain between the Corallian escarpment on the west and the Bathonian and Bajocian terrace on the east. This district is known as *la Woëvre*, though the precise restriction of the name to the Oxfordian plain is rather a geographer's convention than a phenomenon of local usage, since at least one village with the suffix *en-Woëvre* lies not in the plain but in the Côtes de Meuse. Probably *la Woëvre* originally meant no more than the great forest that stretched from the Moselle to the Meuse before the Oxfordian plain was cleared for agriculture; when this was done, the plain, as the only inhabited district in this area, became the Woëvre *par excellence*.

This plain extends north to Stenay, reaching the Meuse between that town and Dun, and south to Neufchâteau. Its 'aureole' shape is very well marked; it is a crescent, of which the western or concave edge is formed by the curved escarpment of the Côtes de Meuse, which drops abruptly in a wall about 150 metres high, and eastern or convex edge by the transition from the clay plain to the oolite plateau known in the south as the Haye, in the north as the Briey plateau. This eastern limit is not always clear. Roughly speaking, it is formed by a line passing through Neufchâteau, Colombey, Aingeray on the Moselle, Domèvre-en-Haye, Thiaucourt, Conflans, Spincourt, and Stenay. Here and there, as near Colombey, between Aingeray and Manonville, and in places between Chambley and Spincourt, the clay plain on the west is separated by an unmistakable scarp from the higher limestone plateau on the east. But often the transition is very gradual, and no accurate demarcation is possible.

Thus the Woëvre begins in the south as a narrow strip between the Meuse and the Vair (this part is known as the *Soulossois*) and gradually broadens to about 12 miles between

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Châtillon and Conflans-en-Jarnisy, after which it bends north-westward and again contracts to a mere spur thrust between the Meuse and the Chiers.

The subsoil is a heavy blue clay, 200 metres thick, which gives to the district its peculiar character, though it never appears at the surface. On the west it is overlaid by a stratum of limestones and marls, the so-called *terrain à chailles*, which composes the lower part, and in places the whole, of the escarpment of the Côtes de Meuse. Everywhere the surface soil of the Woëvre contains much limestone, the débris of the oolite plateau that once covered it and of the Côtes de Meuse which the Woëvre streams are still washing away. This calcareous surface soil, coloured by iron hydroxide, greatly increases the fertility of the plain and lessens the difficulty of agriculture. Even so the soil is extremely heavy and clayey, and demands great labour in ploughing. Here and there the plain is broken by limestone *buttes*, outliers of the Côtes de Meuse. The most conspicuous are Mont St. Michel, the fortified acropolis of Toul, and the Côte St. Germain close to Dun.

The impermeable clay subsoil gives rise to a vast number of small streams and lakes. Many of the latter are as much as a square mile or more in extent. Though the rainfall is not high for Lorraine, the soil becomes very wet and swampy in winter: the sluggish streams overflow, the lakes expand to enormous size, and the country becomes a mass of viscous mud. The drainage is all eastward into the Moselle, with the exception of a few small rivers in the extreme north; the streams rise at the contact of the oolite and the clay, at the foot of the Côtes de Meuse, and run very sluggishly eastward over the level plain till they gather into the rivers (Orne, Rupt de Mad, Ache), which drain their waters through gorges in the plateau of inferior oolite into the Moselle valley. There is little doubt that the Woëvre formerly drained through the defiles of the Côtes into the Meuse; but the progressive capture of that river's tributaries by its neighbours, to which we have already referred, has deprived it of almost all the Woëvre drainage.

The population is concentrated in large villages, especially at the foot of the Côtes; this is partly due to the limestone soil which gives good vineyards and orchards, partly to the fact that the only easy line of communications runs here, where the innumerable streams can be crossed at their source.

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The Woëvre, with its heavy and fertile soil, is an agricultural district. It has been almost entirely cleared of timber, which lingers only on outcrops of clay that are too cold and wet for cultivation. A few villages have small timber industries, and some make wine ; but cereals are the chief resource.

The Lower Oolite Terrace

The Bathonian and Bajocian limestones (sometimes referred to as the Dogger beds) continue the plain of the Woëvre eastward in a belt of districts known successively from south to north as the Haye, Jarnisy, and Briey plateau. These again are terminated eastward by an escarpment not unlike that of the Corallian terrace but higher (250 metres above the plain at its foot, as opposed to 150–200) and even more continuous.

The escarpment begins about 20 miles north-east of Langres, close to the source of the Meuse. Running at first north-eastwards, it is pierced by numerous defiles, through which the tributaries of the Meuse (Mouzon, Anger, Vair, Vraine) carry off north-westwards into the Neufchâteau basin the drainage of the Liassic plain between Montigny-le-Roi and Vittel, as the defiles of the Côtes de Meuse once drained the Woëvre before their streams were captured by the Moselle. From Vittel the escarpment bends round to north-north-west, and some remarkable outliers, of which the Côte de Vaudémont is the chief, are seen. It crosses the Moselle at Pont St. Vincent and overlooks Nancy from the west ; then runs down the right bank of the Moselle from Frouard (at the junction of the Meurthe) to Ars, where a strip of the plateau has been detached by the river-valley to form an isolated range of hills on its right bank comparable to the Côtes de Meuse, similarly caused, on the right bank of the Meuse ; then continues down the left bank of the Moselle past Metz and Thionville due northwards, to swing abruptly round westwards on reaching the Luxemburg frontier, and die away at Longwy.

The terrace lying behind the summit of this escarpment is composed of the Bathonian and Bajocian formations. These are oolites and marls ; the oolitic character of the terrain is most marked in the south, while in the north there is a strong admixture of marls. The southern district, in which oolites predominate, is the Haye. From the Vair to the Moselle, the

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Haye is an arid plateau very heavily grown with timber and seamed by a network of long dry valleys of great depth with vertical sides, in which rivers once ran carrying to the Meuse the drainage of the Xaintois, which now goes to the Moselle by way of the Madon. Many of these ravines are cut down to the marls of the Lias and have in consequence springs and meadows on their bottoms; thus arise such place-names as Vallée-des-Foins, Pré-de-la-Vallée, &c.

Inside the angle of the Moselle, between Toul and Nancy, lies the Forest of the Haye, a massif entirely covered by dense forests and a formidable obstacle to communications. It lies exactly in front of the Pass of Toul, and its forts are the first line of defence for that pass.

Farther north the Haye continues northwards to a line marked by a fault running from St. Benoît-en-Woëvre through Charney, St. Julien, and Gorze to Metz, and bounded on the west by a slight escarpment facing west and running from Aingeray to Tremblecourt, Domèvre-en-Haye, and Manonville. This region again is deeply ravined, but here the ravines carry streams which drain the Woëvre. On the clay they flow slowly; but on entering the oolite they cut for themselves narrow gorges 20–80 metres deep in which they flow rapidly eastward to join the Moselle. The Rupt de Mad is the largest and most typical; others are the Ache and Terrouin.

The oolites afford good building-stone and are quarried almost everywhere. The surface soil is not a great source of wealth; it is a mixture of sand and clay, known from its colour as *terre rouge* and seldom more than 3 ft. thick. A deposit of white loam here and there enables it to hold water and makes it a tolerably good arable soil; otherwise it is poor. The valley-bottoms, fertilized by the clay of the streams, have rich meadows, and the vines on the limestone slopes give good wine in some places. Hops grow well on the light soils. But for the most part the Haye is incapable of producing anything but timber.

The (Briey plateau) with its southern annexe, the (Jarnisy) continues the Haye north of the latitude of Gorze. It is markedly less arid and less timbered than the Haye; the soil is more marly and richer, the population higher, and agriculture more successful. The oolite seldom comes to the surface except on the extreme east, where it crops out in fantas-

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tically shaped blocks as the crown of the escarpment overlooking the Moselle valley. Below this the escarpment is formed of the yellow 'Jaumont oolite' and a talus of Liassic marls. The surface of the plateau, which is formed of north-and-south belts of clays, marls, and oolites, is masked by diluvial deposits either of gravel or of a loam containing iron hydroxide and recalling the *terre rouge* of the Haye.

The hydrography resembles that of the northern Haye. The Orne drains the whole centre of the Woëvre by means of a network of sluggish clay-streams, and then flows rapidly through an oolite gorge to the Moselle. Most other rivers of the Briey plateau rise in springs proceeding from the clay beds in the oolite and run through very narrow clefts. Certain rivers in the north flow through deep and narrow valleys westward to join the Meuse, by way of the Chiers. These limestone rivers of the Briey plateau give a tolerable amount of water-power.

The plane of contact between the Bajocian oolite and the underlying beds of the Upper Lias is marked by a stratum of the most valuable iron-ore in Europe. This ore, the so-called *minette*, crops out along the escarpment from Longwy to Nancy and underlies the Briey plateau in a thick and continuous deposit. It is described below (see Chapter XIII, p. 308), and it gives rise to one of the chief problems, if not the chief problem, connected with the international position of Lorraine.

The Liassic Belt (La Plaine, Jurassic Section)

The lowest group of the Jurassic series is the Lias. This forms a well-marked belt passing down the centre of Lorraine, bounded on the west by the Bajocian escarpment and on the east by a curve passing through Mirecourt, Château-Salins, and Thionville. It may be analysed into four parallel subdivisions: first, a thick mass of marls and clayey shales; secondly, a thin belt of gritty limestones (the so-called Middle Lias grits), forming a slight escarpment dropping to the third belt, a mass of marls and dark blue limestones, containing phosphate beds; fourthly, the Rhaetian sandstones, the uppermost beds of the Trias, forming a well-defined escarpment, which divides Jurassic from Triassic Lorraine.

But the geological division does not correspond very well with the geographical. The oolitic Lorraine of the Jurassic terraces is now left behind; and we have entered *la Plaine*,

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the level, rich agricultural district of eastern Lorraine. Part of the Plain is Liassic, part Triassic ; but the Lias plain and the Keuper plain, though separated by the Rhaetian sandstone ridge, form for geographical purposes a single unit.

The southernmost extremity of the Liassic belt is a narrow tongue of land, between the Faucilles and the Bajocian escarpment, which contains the head-waters of those streams which unite at Neufchâteau to form the Meuse. This strip already shows the characteristics of the Plain : a clayey or marly soil with plenty of calcareous elements, fertile and good for agriculture ; small streams and compact villages. North-east of the Vair it broadens out, and is here known as the Xaintois, a rich farming district dominated by the isolated hill of Vaudémont, an outlier of the Bajocian escarpment, and drained by the Madon. Its centre is the little country town of Mirecourt ; and, protected as it is by the wooded heights of the Haye to west and north-west, the district is one of the most prosperous in Lorraine.

The boundary between the Lias and the Trias crosses the Moselle at Flavigny and the Meurthe at St. Nicolas-du-Port. The triangular district between these points and Nancy is the Vermois. North of the Meurthe the Lias belt enters the Saulnois or district of Château-Salins, whose eastern part lies on the Keuper ; this section of the Liassic plain is studded with the group of Bajocian outliers, which together form the *Grand Couronné de Nancy*, the hills on which the German move against Nancy broke in 1914. Farther north again is the Messin, a rich arable district bounded to west by the Bajocian escarpment and to east by the wooded range of hills which mark the outcrop of the Rhaetian sandstone. This outcrop, the Rhaetian escarpment, can be traced throughout Lorraine from north to south. Wherever it appears, its light and sterile soil is generally wooded, and this marks it off sharply from the rich clayey lands on either side, which have been almost entirely cleared of timber, and whose monotonous stretches are completely given over to the plough. Only in the Saulnois and Messin is there much grass-land. The surface soil, which benefits by the alternation of clay and limestone, each correcting the deficiencies of the other, is largely composed of diluvial deposits of sand and gravel overlaid by yellow loam 1 to 10 feet thick.

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The Keuper Belt (La Plaine, Triassic Section)

The topographical distinction between the Lias and the Keuper is much slighter than might be expected on passing from the Jurassic to the Triassic series. The main difference is that, whereas the Lias has alternating beds of clays, limestones, and shales, which give it a certain variety and prevent excessive monotony, the Keuper consists of a homogeneous mass of marls, all equally heavy and impermeable, resembling in many ways the Oxford clay of the Woëvre, and giving a soil less favourable to agriculture than that of the Lias.

The southernmost extremity of the Keuper belt is a very narrow strip of plain from Vittel to Lamarche, whose impermeable soil is the source of the Mouzon, Anger, and Vair, tributaries of the Meuse. These find their way northward through defiles in the Rhaetian escarpment, along whose foot runs the Mirecourt–Langres railway through Vittel, Contrexéville, and Martigny; in front of this escarpment stand various Liassic outliers, notably the Hautmont. After crossing the Madon above Mirecourt the Keuper belt opens out, but its topography becomes extremely confused in detail, owing to the Liassic outliers (e. g. Côte d'Essey, with basalt dykes, east of the Moselle), and still more to the vast deposits of diluvial gravel from the Vosges, known as *terre blanche*, and forming large irregular hills overgrown with forest. With these exceptions the Keuper belt is fairly free from timber, giving as it does a good agricultural soil especially favourable to cereals.

About the Marne–Rhine canal the character of the landscape changes. The diluvial gravel hills, with their forest-covering, almost entirely disappear, and we enter a level plain, rolling and largely treeless, with a heavy infertile soil and large lakes surrounded by forest, like those of the Woëvre, in the hollows. This is the Saulnois, valuable for the rock-salt deposits in the Keuper, which have been exploited from time immemorial up and down the Seille. North of the Seille the gravel deposits recommence; the wooded hills north of Château-Salins and Dieuze are formed of Vosges detritus, like those near Lunéville and Charmes. The Keuper belt now narrows again and swings round north-westward down the Nied valley to reach the Meuse about Sierck.

The Plain is the heart of Lorraine and the centre of its

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characteristic life. Appearing as a flat and relatively depressed area between the Vosges to east and the oolitic terraces to west, it is the distinctively agricultural region of Lorraine. It has the richest soil and the smallest percentage of forest; indeed timber is almost absent except on the diluvial gravel deposits, whose aridity and barrenness make them unsuitable for cultivation, and on the belt of Rhaetian sandstone, for the same reason. From these sources the large agricultural villages of the Plain draw the necessary supply of timber, and their crops and orchards profit by the shelter which the forests afford.

On the other hand, apart from the salt deposits of the Saulnois, and an outlying margin of the Saar coalfield farther north, the Plain has no mineral wealth; neither has it any industries. It is thus a comparatively thinly populated district, and without any of the international economic importance of the mining districts to north and north-west and of the industrial valleys of the Vosges to south-east.

The Muschelkalk Belt

The Muschelkalk forms a narrow belt of limestone country between the marly plain of the Keuper and the hilly or even mountainous red sandstone country which forms the foothills of the Vosges. It is a hard yellowish rock, full of fissures, and in consequence highly permeable; the country which it constitutes is in parts arid and somewhat barren, more suited to growing timber than to agriculture, in parts clayey and rich.

In the extreme south the Muschelkalk forms an escarpment, doubled through the agency of a fault, overlooking from the north-west the wooded plain known as the Vôge, in which the head-waters of the Saône flow and the towns of Darney and Bourbonne-les-Bains stand. These streams in fact rise at the foot of the escarpment, which is thus the watershed between the North Sea and the Mediterranean and the boundary between Lorraine and Burgundy.

This Muschelkalk escarpment is known as the *Monts Faucilles*. It is in reality a very insignificant feature, and its name has become famous only in consequence of the emphasis laid by a past generation of geographers on watersheds simply as such. The meaning and application of this name are obscure; but the facts appear to be that the term *Faucilles* was originally applied to the Muschelkalk escarpment, and was derived from

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a Celtic root akin to the Latin *fagus* and meaning beech-tree. Later the word became confused with *faucille*, 'sickle', and the idea sprang up that it must have been applied to a curved range of mountains resembling a sickle on the map. Accordingly it became the fashion—a fashion still current among map-makers—to define the Monts Faucilles as a curved mountain chain beginning at the Bâlon de Servance and running north-west down the left bank of the Meuse to Épinal, and then curving west and south-west in the direction of Langres. Such a chain has no geographical unity whatever, since one-half of it belongs to the crystalline Vosges and the other to the terraces of Lorraine; nor could anybody, in the age before maps were drawn, fancy that it resembled a sickle. But as against the suggestion of a Celtic origin it must be observed that the name cannot be traced far back; and it may be the mere invention of a modern geographer.

The crown of the Faucilles escarpment is a dry limestone plateau passing very quickly to the Keuper marls, which carry the sources of the Meuse tributaries. This plateau is of importance strategically, as carrying the road from Langres to Épinal. The second Faucilles escarpment, a mile or two in advance of the first, is a much less continuous range of hills, overlooking Monthureaux and Jesonville. The two escarpments together form the Faucilles system and the southward limit of Lorraine.

The plain overlooked by the Faucilles, in which the Saône rises, is called the Vôge or Vosge. It is formed of red sandstone, well watered, and densely afforested; it is mentioned here because, though it falls outside Lorraine, its name is of interest. It is the ancient *pagus Vogesensis*, and the Vosges mountains in all probability took their name from it, as the mountains immediately adjoining it. At present the mountains are the better known of the two, and tend to overshadow the true Vôge. Originally it appears that *Mons Vogesus* meant not the Vosges but the Faucilles.

To the north-east the Muschelkalk expands into a considerable area north of Épinal, and forms part of the Plain. But it rapidly contracts again and runs in a narrow belt down the Saar, always betraying its presence by a strip of somewhat hilly country. At Saargemünd it turns abruptly west and forms an amphitheatre of hills circling round the low-lying forest of St. Avold, after which it continues northwards in a long range of hills to cross the Moselle between Sierck and Trier.

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The Moselle Valley

The Moselle valley has not the same strongly marked unity as the Meuse. The Moselle rises in the Vosges, as do all its chief tributaries, and this gives it a character totally different from the Meuse, which is a plateau river from first to last; it passes through many distinct phases; and instead of being like the Meuse, an isolated river with a dwindling traffic and a small and decreasing population, it is a busy stream, studded with towns and industries and flowing through densely populated regions. The Meuse has five small towns with a combined population of 36,000; the five largest towns on the Moselle have a population of about 130,000, even ignoring Nancy as just off the river, with a population of about 100,000, or half as much again as the whole Meuse valley put together.

This difference is directly due to geographical factors. The Meuse flows between oolitic heights, barren, forest-clad, and uninhabited; each of its basins is relatively isolated from the others and from the outside world; even where lines of traffic pass through it, as at Verdun, the Pass of Toul, and Neufchâteau, there is little to attract a large permanent population. It has no tributaries below Neufchâteau to bring in converging lines of traffic, and no natural wealth to stimulate trade.

The Moselle on the other hand passes through the fertile Plain, and so forms a line of communication through a comparatively prosperous and populated district. It has a large number of tributaries which attract traffic from all sides and concentrate it at certain nodal points, especially Metz and Nancy, the points from which the chief rivers, entering or emerging from the Bajocian escarpment, radiate traffic-routes across the Plain. The greater rapidity of the rivers in the Moselle system, after they emerge from the Vosges, enables them to be used, which the Meuse never can be, as a source of water-power; and finally, Nancy, Metz, and Thionville are the natural centres for exploiting the precious iron-ore deposits of the *minette* field.

At Épinal the Moselle emerges from the Vosges and enters the Plain of Lorraine. It traverses the Plain in a broad, flat-bottomed valley about a mile across. The soil in the valley-bottom is alluvion from the Vosges, naturally sterile, but fertilized by careful irrigation, and in consequence forming

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rich meadows seamed by water-cuts. The valley stands curiously aloof from the life of the Plain on either hand; its inhabited centres are industrial towns and villages of recent growth, resembling those of the Vosges; the agricultural villages of the Plain never descend into the valley, and there is very little contact between the two populations. The valley is a busy line of communication, with road, railway, and canal.

At Charmes the river emerges from the Muschelkalk and enters the Keuper; at Flavigny it enters the Lias; and at Pont St. Vincent it plunges into a gorge between heights of Bajocian oolite. It has left the Plain and is now traversing the Haye. On reaching Toul it formerly flowed on, through the Pass of Toul, to join the Meuse; but having been captured by a left-bank tributary of the Meurthe, which joined that river at Frouard, it bends abruptly back to traverse the Haye once more, and to unite itself with the system of which the Meurthe was once the leading member.

From Frouard to Metz it flows through an oolite *couloir* like that of the Meuse; here, and here alone, the so-called sister rivers really show some degree of resemblance. Pont-à-Mousson is the centre of a 'basin' much like the Commercy basin of the Meuse, with oolite heights on either hand; but the river is fifty metres lower in elevation than the Meuse, and the heights are correspondingly more striking. The right-bank heights form a very narrow range, capped with Bajocian oolite, and formed for the most part of Liassic marls. The heights on both banks are less continuous than those of the Meuse; the presence of tributaries in the case of the Moselle causes gaps, notably those by which the Ache and Rupt de Mad bring the drainage of the Woëvre through the Bajocian massif.

Immediately above Metz, at Ars, the Moselle emerges from its *couloir* into the Messin. The Bajocian escarpment, here 200 metres above the level of the river (Mont St. Quentin, the fortified acropolis of Metz, is a vine-covered hill 360 metres in altitude), retreats from the left bank, and the right bank is open country. Here the Moselle flows over Lias, but it has laid down for itself a bed of alluvial deposits, several miles broad, which consists of Vosges detritus ground down to a brownish loamy sand. Over this the Moselle flows till at Sierck it leaves Lorraine.

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CHAPTER IV

RIVER SYSTEMS AND LAKES

APART from certain marginal areas, Alsace-Lorraine is drained by three rivers—the Meuse, Moselle, and Rhine. Of these the Meuse is the least important; it drains only the extreme western districts, and the area of its basin and the amount of water it carries off are small. The Moselle, with its tributaries, drains the whole western slope of the Vosges, almost all the Lorraine plateau, and even a part of Alsace; while the Rhine drains the Alsatian plain and the eastern slope of the Vosges.

THE MEUSE SYSTEM

It has already been explained that, apart from insignificant streamlets, the Meuse has, from Neufchâteau to below Stenay, no tributaries. It has also been observed that this is a consequence of its geological history, which has doomed it to reach the sea through the hard and resistant Primary rocks of the Ardennes, with the result that its rate of erosion is slow; it is, as it were, dammed up while its neighbours cut their beds lower and lower and capture its tributaries one by one. Moreover, not only is the general level of the Meuse high as compared with its neighbours, but it has a very slight fall from its source to the Ardennes. This is because it is an old-established river, which has reached an advanced stage in the 'cycle of erosion' and cut its bed as low as it can get till it has overcome the Ardennes obstacle. Five miles from its source the Meuse is falling at a gradient of only 3·2 ft. per mile, and for 100 miles this remains the average; the Moselle at 50 miles from its source is still falling 11·7 ft. per mile, and 100 miles from its source, near Toul, 5·3 per mile.

At present then the Meuse reaches its full volume, or something very like it, at Neufchâteau, where it is formed by the confluence of a number of small rivers. Most of these rise on the Keuper plain between Vittel and Lamarche, immediately

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behind the Faucilles escarpment, or on the Lias of the western Xaintois and the northern Langres plateau. The head-waters of the Meuse, near Montigny-le-Roi north-east of Langres, fall in the latter class, as do those of the Vraine west of Mirecourt in the Xaintois; the Mouzon, Vair, and Anger rise on the Keuper. These streams, flowing north and north-west, penetrate successively the Liassic and Bajocian escarpments, here only a few miles apart; between the two they pick up the drainage of the Liassic plain. At Neufchâteau they unite in a large open basin (strictly the Meuse and Mouzon meet at Neufchâteau, the Vair entering a few miles lower down), and from this point the Meuse hardly receives any fresh supplies of water till it has left Lorraine.

Before reaching the Pass of Toul it receives two small right-bank tributaries which come from the Woëvre through defiles in the Côtes de Meuse; these are the Ruppes and the Colombey. Similar streams once came in through the defiles near Commercy and St. Mihiel; but these have all now been deflected eastward to the Moselle. Even the Ruppes and Colombey have been severely mutilated by the encroachment of the Moselle tributaries. The Meuse's greatest loss is that of the entire upper Moselle, which once flowed in through the Pass of Toul bringing a great volume of water from the Vosges and all the drainage of southern Lorraine.

It is unnecessary to enumerate the streamlets which reach the Meuse from the gorges of the Côtes on one side and the Verdunois on the other. They bring in little water, and what they bring is largely intermittent, and mostly in the form of springs, directly feeding not the Meuse but the subterranean water-stratum which its alluvial bed contains.

The Chiers[1], flowing in just above Sedan, is, however, a tributary of importance. It rises in Luxemburg and flows past Longwy to Montmédy in a somewhat deep gorge cut in the oolite of the Briey plateau. Its eastern feeders, notably the Crusne, are similarly limestone streams flowing in gorges with a fair degree of rapidity; its southern tributaries on the other hand flow from the Woëvre (Othain, Loison, Tinte) and are sluggish clay-streams draining the northern Woëvre lakes. There is evidence that these were once much longer than they are now, and that their head-waters have been captured by the

[1] Pronounce *Kière*.

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Orne in the interests of the Moselle system. Thus the Longeau, flowing in the valley of Les Éparges, west of Fresnes-en-Woëvre, is the sole relic of a river, perhaps the head-waters of the Tinte, which flowed north to join the Crusne.

The régime of the Meuse is controlled by the fact that almost all its water comes from the impermeable soil of the plateau south of Neufchâteau. A heavy fall of rain here causes a flood down the whole length of the valley; and hence floods are common, and do much damage. The normal rise of the river begins in November and reaches its maximum in January; it then declines to July, rises slightly again, under the influence of the heavy summer rainfall, in August and September, and sinks to a secondary minimum in October, the autumn being as a rule dry. This average movement is, however, interrupted every year by abnormal incidents, especially summer floods, which devastate the meadows all down the valley and, by spoiling the hay crop almost two years out of every three, contribute to the paucity and poor condition of the population. These summer floods do nothing but damage; the normal winter rises on the other hand bring down a fertilizing mud.

The Meuse flows over permeable oolite all the way from Neufchâteau to Dun, and it was formerly believed that in consequence it lost much water by infiltration westward, down the dip of the strata, into the Seine basin. This has, however, been disproved. Minor local infiltrations do take place; but these add water to the Meuse more often than they abstract it. In fact the Meuse never comes into contact with the oolite, flowing as it does over a vast mass of alluvia, which have securely puddled its permeable trough and rendered it watertight. At Verdun the Jurassic alluvia are some 30 ft. thick, and below this again comes the Vosges alluvion which was deposited before the diversion of the Moselle from the Pass of Toul took place. Since the Meuse lost the water of the Moselle it has not had sufficient power to go on eroding, and has been laying down an alluvial bed for itself, which is now sufficient to retain all its water even in floods.

Shrunk as it is, and twisted into numberless meanders, the Meuse is not a waterway; nor does it supply more than a very little water-power. A scheme was put forward about 1881 for barrages on the upper Meuse (above Neufchâteau), Mouzon, and Vair, which would hold up flood-water and thus benefit

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agriculture in the valley, at the same time supplying water-power for industries in the neighbourhood of Neufchâteau. This scheme has, however, not been carried out.

The Chiers system supplies a good deal of water-power. The oolite streams are rapid, and are much used by mills. They are, however, very low in summer, and rise only at the beginning of winter. The Crusne supplies power to paper and cloth-mills; the Chiers to the factories of Longwy.

The Moselle System

The Moselle is in every way a striking contrast to the Meuse. It rises among high mountains and enters the Lorraine plateau only after many miles of almost torrential flow; crossing the plateau it is still rapid, and carries down a great body of water; it receives numerous large tributaries, some hardly smaller than the main stream; and its banks are busy and populous.

The Moselle and all its chief tributaries rise close under the main summits of the Vosges. The source of the Moselle is a spring situated near the Col de Bussang; at the village of Bussang it is already a mountain rivulet of considerable size, formed by the union of several streams. It flows for another three miles south-westward, after which it takes up a general north-westerly direction, maintained until Toul is passed. Its valley is flat-bottomed and broad, covered with irrigated meadows (see p. 76), and hemmed in on either hand first by the forest-clad mountains of the Vosges and later by the lower hills of the Lorraine plateau.

Its main tributaries are all on the right bank. The Moselotte, flowing in at Remiremont, drains all the western side of the Vosges watershed from the Col d'Odern to the Hohneck through its numerous small feeders. The Vologne, flowing past Gérardmer, Granges, and Bruyères, drains a considerable basin of low-lying country between the Vosges watershed and the sandstone lateral chain; its valley contains several remarkable features, such as the great gorge below Gérardmer, and the lakes of Gérardmer, Longemer, and Retournemer.

Below the confluence of the Vologne the Moselle reaches Épinal and emerges into the plain. It is a remarkable fact that while crossing the plain it receives no tributaries of any size; its next, the Madon, reaches it at Pont St. Vincent, where

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it plunges into the Bajocian escarpment of the Haye. The Madon is the river of the Xaintois. Like the head-streams of the Meuse, it rises almost on the summit of the Faucilles, and flows, a small and not a rapid stream, first over the Keuper marls and then over the Lias. Unlike the Meuse, however, it remains on the Lias for the rest of its course. It flows in a narrow, tortuous valley, little traversed by any traffic and only studded with small, lonely villages. It is formed by a little fan of tributaries just above Mirecourt (its only town) much as the Meuse is formed at Neufchâteau.

A few miles below the confluence of the Madon the Moselle reaches Toul and turns abruptly eastward again. We have already described (pp. 64, 79) how it formerly flowed straight on here, through the Pass of Toul and the Val de l'Ane, to join the Meuse. On reaching Frouard it receives the most important of all its tributaries, the Meurthe.

The Meurthe rises on the Schlucht Pass, and flows through some of the most striking gorges of the Vosges till at Fraize it emerges into the low country of the St. Dié depression. At St. Dié the mountains again approach it close on either hand, forming, as it were, the waist of a figure of 8 whose two lobes are the St. Dié depression and the Moyenmoutier depression. Below Moyenmoutier the mountains begin again, and the Meurthe does not finally emerge from them till, after passing Raon-l'Étape, it reaches Baccarat.

Like the Moselle, the Meurthe receives a large number of tributaries in its upper course. Most of these flow in longitudinal valleys parallel to the main watershed of the Vosges. All the chief tributaries of this region (in this again the Meurthe resembles the Moselle) enter on its right bank. Such are the Fave, rising near the Col de Saales and flowing in at St. Dié; the Rabodeau, on which stand Senones and Moyenmoutier; and the Plaine, rising on the Donon and flowing parallel to the Rabodeau to debouch at Raon-l'Étape. This is a typical longitudinal valley—long, straight, and steep-sided, differing entirely from the open and flat-bottomed trough-valleys of the Alsatian slope.

The Meurthe now winds across the plain in a rather ill-defined valley as far as Lunéville. Here it receives the Vezouse on its right bank and, soon afterwards, the Mortagne on its left. These are rivers which rise only on the edge of the Vosges

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massif; their head-waters do not penetrate into the heart of the mountains, and consequently their volume of water is small and their value as lines of communication slight. The Vezouse, whose sources lie adjacent to those of the Saar, has a great number of insignificant tributaries draining the last slopes of the Vosges and the plain between Cirey and Lunéville. The Mortagne, a somewhat more important stream, rises close to Bruyères in a cup-shaped hollow of the Vosges, floored with Permian and walled with harder Triassic sandstones, and forming a glade in the midst of magnificent forests. This hollow communicates, by way of Bruyères, with the Vologne valley and thus gives easy access from the Mortagne valley to Gérardmer or Remiremont. After leaving the mountains, the Mortagne flows past Rambervillers and Gerbéviller, collecting numerous small tributaries as it flows through the plain.

At Dombasle the Meurthe leaves the Keuper and enters the escarpment of the Rhaetian sandstone. Here enters on the right bank the Sanon, a sluggish rivulet of the Saulnois, rising among the lakes of the Keuper plain and flowing along the line followed by the Marne–Rhine canal.

The Meurthe now crosses the Liassic plain—here only three or four miles wide—to Nancy, at the foot of the Bajocian escarpment of the Haye. Leaving Nancy it enters the escarpment and shortly afterwards debouches into the Moselle at Frouard.

Below Frouard the Moselle is a large river, carrying the whole western drainage of the High Vosges. In this part of its course it has no first-rate tributaries but several second-rate. The largest is the Seille, entering on the right bank at Metz. This is a very sluggish river [1] carrying down little water; it belongs entirely to the Messin and Saulnois plains. On the left bank the Ache, Rupt de Mad, and Orne have a strongly marked character. Each rises in springs at the foot of the Côtes de Meuse, and drains a section of the Woëvre by means of a complicated network of innumerable sluggish streamlets, expanding

[1] Between Château-Salins and Metz the Seille has an average fall of only 2·3 ft. per mile. In its lower course, for about 30 miles above Metz, the fall is more like 1·7 ft. per mile. Owing to its sluggishness and the flatness of its valley, it is peculiarly liable to floods, which make the land in its valley almost worthless. The channel has, however, been improved (1896) from Dieuze to Chambey, and again along the Franco-German frontier, which has made it possible to reclaim a large area of meadow-land.

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after rain into pools and swamps (the Orne rises 10 ft. in wet weather); each finally unites these tributaries into a single stream at the point where it leaves the Woëvre, and then, entering the oolite of the Haye, cuts itself a gorge through which it flows rapidly down to join the Moselle. This profile—sluggish head-waters and rapids on the lower stream—is characteristic of 'young' rivers; and it is generally agreed that the Moselle system has only recently captured the drainage of the Woëvre, which formerly flowed northwards to join the Chiers. The earlier stage of the history of such a river as the Orne may be seen in the Fensch, which has not yet cut its head-waters far enough back to reach the clay plain, but will in time compete with the Crusne for the drainage of the Briey plateau.

At Sierck the Moselle leaves Lorraine. Below this point it receives two important tributaries—the Sauer, with all the drainage of Luxemburg, and the Saar, to be described below; these both debouch close to Trier. Hence to its mouth, at Coblenz, the Moselle flows in a remarkable tortuous *couloir*, whose meanders are deeply cut into the plateau of the Schiefergebirge. This part of the Moselle's course lies altogether outside our area, but its character is of some importance with reference to the question of communications.

The Moselle system as a whole is very rich in water-power. The rainfall on the western slope of the Vosges is large, and it is all drained by the Moselle system—almost all indeed by two of its members, the Meurthe and the upper Moselle. These rivers are accordingly good sources of power. It has been extensively used for industrial purposes in the past; the rise of industry in the western Vosges after 1871 depended for its success to a great extent upon the ease with which water-power could everywhere be obtained. But water-power, here as elsewhere, was found unsatisfactory for the purposes of cotton-mills, and steam-power was before long substituted in the majority of the establishments. The water-power of the Vosges is still, however, widely used for saw and other mills, lighting installations, &c., and its utilization could probably be extended with proper attention to the purposes for which it is most suitable. Even in the plain the larger rivers, notably the Moselle, have a gradient and a rate of flow which enable them to be used as sources of power. The smaller rivers of the plain are of course less suitable, though most of them have a few water-mills.

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For navigation on the other hand the Moselle system is most unfavourable. Timber can be floated down the Moselle for a great distance, and this was actually done as early as the seventeenth century; but its rapidity and shallowness make it a bad river for navigation. Its tributaries are in no instance navigable. For improvements, canalization, &c., see Chap. XV.

The Saar System

The Saar is a tributary of the Moselle, but joins it outside the borders of Lorraine, and it may therefore be considered as a relatively independent drainage system.

The Saar rises in the forests of the Donon, with two main head-streams—the White Saar and the Red Saar. Close to the sources of these streams the Zorn, Plaine, and various tributaries of the Breusch take their origin; so that the Donon is a centre of radiating streams.

The river soon emerges from the Vosges; its two branches unite, and it flows northward across the Lorraine plateau in a narrow, winding valley of no great depth, hemmed in by low rounded hills. Only after passing Saargemünd does it become at all picturesque; its banks now rise into steepness, but are covered with mines, factories, and the dwellings of the working population. Here the Saar passes out of Lorraine.

The Nied is the only tributary of the Saar which need be here described. It flows north-east to join the Saar below Saarlouis; but its upper waters, the French Nied and the German Nied, flow in a very different direction. The French Nied flows west and then north-west, in the direction of Metz, turning suddenly through a right angle to flow north-east. The German Nied flows south-west at its source, and turns through a complete semicircle. The cause of this is the anticlinal of Saarlouis, which causes the red sandstone to project into Lorraine in the forest of St. Avold, while the Muschelkalk forms a horseshoe of hills round the sandstone district, like the rim of a gigantic crater The Nied owes its curvature to the fact that it drains and follows the outside edge of this rim of hills, following the junction of the Muschelkalk and Keuper strata. It is a sluggish river with a low gradient, and its flat valley-bottom is therefore extremely subject to floods.

The Saar has no very great value either as a source of power or as a waterway. Its upper course is studded with mills, which

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are especially frequent on the Red Saar ; lower down, where it reaches the plain, its capabilities are much less. On the whole it is not a rapid river, falling only 2·3 ft. per mile at Saarbrücken, 75 miles from its source (cf. 8·2 ft. per mile, 75 miles from source, in the case of the Moselle ; the middle and lower Saar has only about the same gradient as the Seille). Both branches of the Nied have very small gradients and are of little use as sources of power ; they flow in meandering beds through flat-bottomed valleys, with meadows on either hand.

The Rhine System

The Rhine and its tributaries drain the whole Alsatian plain together with the eastern slope of the Vosges. Indeed the whole of the Low Vosges falls within the Rhine basin.

The Rhine itself drains very little of Alsace. When it enters that province, immediately after leaving Bâle, it is already enclosed in an alluvial bed lying isolated among the gravels laid down by the river itself in the diluvial period ; these gravels intercept all the smaller tributaries coming either from Alsace or Baden, and absorb their water into a general reservoir of underground water which is to be found everywhere in the Alsatian plain. This underground water plays a considerable part in the economy of the country ; it preserves the surface of the plain against excessive drought, and it has been tapped by boring so as to provide a water-supply for the town of Strasburg. The water so yielded, filtered as it is by the gravel, is of excellent quality.

The small streams flowing down from the Sundgau and other hills to join the Rhine thus fail to reach it, losing themselves in the gravel ; and the Rhine in consequence is unaffected by local rainfall, and rises or falls as the supply of water from the Swiss mountains increases or diminishes. The melting of the snows causes an abrupt rise in early summer ; this rise soon reaches a climax, and immediately afterwards the river drops to the low level which is normal for Alsace. Rises at other times of year are seldom met with on this part of the river ; the winter floods of the lower Rhine are due to winter rains on the hills of its central basin, and do not affect the Alsatian course of the river. Further, it is important to notice that the Ill, carrying the eastern drainage of the Vosges, does not reach the

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Rhine till 10 or 12 miles below Strasburg ;[1] so that the Vosges rainfall and snow-melting hardly affect the Alsatian Rhine.

It has already been pointed out that the Alsatian Rhine is a rapid and somewhat shallow stream, flowing in an artificial channel constructed during the nineteenth century conjointly by the French and Baden Governments ; and that this channel traverses a region of swamps, forests, and meadows intersected by old arms of the river. At its entrance into Alsace the Rhine is falling 6 ft. per mile or more ; this gradient diminishes gradually and regularly to about 5 at Breisach, 4 at Rheinau, 3 at Kehl, and 2 at the mouth of the river Lauter. Thus above Breisach the Rhine has a very considerable gradient ; and it is not till after passing Strasburg that it becomes at all a placid river. Since the regularizing of the channel, the current has of course tended to increase, and a gradient of say 4 ft. per mile would result in a greater velocity in a channel so improved than in the contorted and obstructed channel of a river like the Meuse.

The Ill, the chief Alsatian tributary of the Rhine, rises in the Jura above Ferrette at an altitude of about 560 metres. Flowing as it does over Jurassic limestone, it disappears close to its source, re-emerging lower down the valley. It is never as steeply graded as the Vosges rivers, but throughout the Sundgau it is a rapid stream, falling 20–30 ft. in each mile. On emerging into the plain at Mulhouse it at once becomes less rapid ; its fall at Mulhouse is 8 ft. per mile, at Ensisheim 6·5, near Colmar 5, at Erstein 3·5. Its gradients as it traverses the plain are thus almost identical with those of the Rhine and are, like them, conditioned by the general south-to-north slope of the plain. But its current is less rapid than that of the Rhine, and it has always been more suitable for navigation, though only for small craft.

The tributaries of the Ill mostly descend from the High Vosges with a very steep gradient, traversing mountain-valleys whose flattest portions have a slope of 30–50 ft. per mile, and crossing a short section of the plain to debouch into the Ill. They have in consequence a very steep slope. The Fecht falls on average 100 ft. for every mile of its course ; the Thur (taking Ensisheim as its mouth) 80 ft. ; the quieter Breusch, flowing

[1] There are, it is true, cross-channels connecting the two rivers for 25 miles above the mouth of the Ill, viz. as high as Erstein.

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through the less steep mountains of the northern High Vosges and rising at a lower elevation near the Col de Saales, 30 ft. These are sufficiently typical of the eastern Vosges streams, few of which have a total course of more than about 30 miles.

Of the rivers of Lower Alsace the Zorn resembles in its upper course those of the High Vosges, rising as it does at an altitude of 800 metres and falling very steeply for the first 10 miles of its course, while it flows in its deeply cut valley northward through the Dabo plateau. After turning westward it at once becomes quieter ; its gradient falls to 14 ft. per mile, and after a rapid section just above Zabern it emerges into the Alsatian plain and crosses it with a diminishing gradient of 4–6 ft. per mile.

The Lauter on the other hand may be taken as typical of the Low Vosges rivers. It rises at an altitude of no more than 340 metres, and within 3 miles of its source has settled down to a gradient of only 10–11 ft. per mile, which it maintains with slight variations for the whole of its course, another 40 miles. After the first few miles there is no difference in gradient between that part of the river which flows among mountains and that which flows across the plain.

All these Alsatian rivers, in spite of their steep gradients, are inadequate sources of water-power. This is because the amount of water they bring down is small. The rainfall of the Vosges is high, but the greater part of it is intercepted by the western slope ; directly the watershed is crossed the rainfall begins to diminish, and in the lower slopes and foothills it is very scanty. The Alsatian rivers have in consequence a much smaller and more capricious volume of water than those which drain the western slope of the Vosges. This makes them unsuitable on the whole, for industrial purposes, and has led to the creation of reservoirs in the numerous mountain tarns, to eke out the scanty water-supply. These are treated below, under 'Lakes'.

Lakes

Alsace-Lorraine is remarkably rich in lakes. Five distinct groups may be distinguished, some of which include hundreds of small sheets of water. These groups are : the Vosges lakes, the Sundgau lakes, the lakes of Belfort, the lakes of the south-western Vosges plateau, and the lakes of Lorraine.

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The Vosges Lakes

The lakes of the mountain district fall into two clearly distinguished types: first, the tarns which occupy corries close to the main watersheds; secondly, the larger lakes of the valley-bottoms. The former are approximately circular in outline; they are generally deep, and the mountain often falls precipitously into them on three sides, while on the fourth the overflow escapes down a steep incline or waterfall to the valley. The valley-lakes are elongated in shape, and seldom very deep; they occur low down in the valleys, at a point where the valley-bottom has become comparatively level. The origin of the corrie-tarns is a controversial subject; the corries, or cirques, in which they occur are generally ascribed to glacial action, which is supposed either to have created them or at least to have shaped and enlarged them; but it has been pointed out [1] that they fail to occur in the regions where the traces of glaciation are most obvious, such as the Thur valley. One fact that has been demonstrated beyond a doubt is that they are true rock-basins. The valley basins on the other hand appear not to have rock sills but to owe their origin to moraine dams thrown across the valley by retreating glaciers.

The corrie-tarns are especially common on the Grosser Belchen–Hohneck–Bressoir ridge; indeed they are almost confined to this ridge. They are most frequent in its middle section, from the Rainkopf on the south to the Diedolshausen gap on the north. Here, for a stretch of 14 miles, the ridge is flanked to eastward by an alternating series of buttresses and corries, and almost every corrie has its tarn. A few even occur on the west side as well. On the same ridge, but outside this section of it, lies the Belchensee, in a corrie below the summit of the Grosser Belchen.

In succession from north to south the chief tarns of this series are as follows:

The Weisser See (Lac Blanc) is the largest of all. It is 72 acres in extent, and its surface is 1,054 metres above sea-level. It is a rock-basin divided into two parts (190 and 157 ft. deep respectively) by a sill whose lowest point is 125 ft. below the surface. It is surrounded for the most part by bold and imposing crags, and fed by a perennial stream flowing through marshy and

[1] By Langenbeck.

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peaty ground. The lake-level has been raised 16 ft. by a dam 100 ft. long ; this was completed in 1858 and increases the lake by 175 million gallons of available water.

The Schwarzer See (Lac Noir) is 35 acres in extent and lies at an altitude of 950 metres. It is separated by a single buttress from the Weisser See. It is a single, almost circular rock-basin with a maximum depth of about 118 ft. A dam has been constructed, 245 ft. in length, which raises the lake-level 30 ft. ; the bulk of water thus made available for industry and irrigation is 57 million gallons.[1]

Both the foregoing drain into the Weiss.

The Forellenweiher (Forlenweiher) lies south of the Schwarzer See. It is a small tarn, 7½ acres in extent, and lying 1,061 metres above sea-level. It was dammed in 1835–7 by the factory-owners of Münster (5 miles distant) ; but this dam was inadequate and was remodelled in 1890. The present dam is 425 ft. long and 41 ft. high, raising the water-level 36 ft. and providing 35·6 million gallons of available water. This was carried out by the State at an outlay of £2,500.

The Daren See (Sulzerner See, Grüner See, Lac Vert) adjoins the foregoing across a buttress to southward. The name Sulzerner See is from the village of Sulzern, immediately below it ; that of Grüner See from its colour, due probably to the green weed which it contains. This weed grows thickly in June and July, leaving the water clear at other times. The lake lies at an altitude of 1,044 metres, and is a circular granite basin with a depth of 50 ft. It was dammed by private enterprise in 1835–7, and the work repaired and enlarged by the State at a cost of £2,000 in 1890–1. The dam as it stands at present is 500 ft. long and 35 ft. high ; it raises the level of the water about 32 ft., and increases the area of the tarn from 10½ to 18 acres.[2] The available water-content is 128 million gallons ; the whole lake contains 640 million gallons.

[1] The reader who should chance to refer to the article 'Stauseen' in *Das Reichsland E.-L.* is warned that the author has confused the above lakes, and ascribed the topographical details of each to the other.

[2] Hergesell and Langenbeck give the area of the lake as varying (according to the state of the water, its shores being somewhat flat) between 39 and 40½ acres. These figures are contradicted even by their own large-scale map, which gives on careful measurement 13·7 acres, and clearly represent an oversight of some kind. Werner, giving an average of 40 acres, probably follows Hergesell.

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The Schiessrotried lies on the south-eastern flank of the Hohneck, above Metzeral. It is 920 metres above sea-level and has an area of nearly 14 acres. A dam 500 ft. long and 40 ft. high, raising the surface-level 38 ft., was built by the State (£73,000) in 1887–91. The available water-content is 71·5 million gallons. The tarn is elliptical in form, measuring about 440 by 270 yds. (The writer in *Das Reichsland E.-L.*, vol. iii, p. 1049, confuses this with the Rotried, a tarn on the *north*-eastern flank of the Hohneck.) Before the building of the dam this tarn had become dry (see below).

The Fischbödle was a dry tarn, dammed for use as a fish-pond by a Münster manufacturer. It is a very small reservoir and has no industrial importance.

The Altenweier was also a dry tarn, situated on the north-eastern slope of the Rainkopf. It was dammed by the State and the local manufacturers at a cost of £13,500 in 1887–91. The dam is 367 ft. long, 50 ft. high, 16 ft. thick at the bottom, and 14 at the top. The water-level is raised 46 ft.; the area of the tarn is 19 acres, and its available water-content 16·5 million gallons. One-sixth of the cost of the dam was contributed locally by the parties interested.

These five tarns all drain into the Fecht, and complete the series of seven corrie-tarns on the east slope of the Rainkopf–Hautes Chaumes ridge. Tarns of the same type also occur on the west slopes of the Rainkopf; the chief are the Lacs de Blanchmer and de Machais, the Sechemer, and the Lac des Corbeaux—all draining into the Moselotte.

It ought also to be remarked that the crags of the Hohneck enclose very numerous dry tarns. All the tarns of the Vosges are short-lived, and the majority have by now cut through their natural rock dams and drained themselves, leaving only a peaty meadow behind. The Schiessrotried and Altenweier have been mentioned as examples of such dry tarns, artificially restored by damming; but there remain in the immediate neighbourhood some 15 or 20 dry corrie-tarns which could be similarly treated if necessary.

The Belchensee is an isolated outlier of this group, lying on the north slope of the Grosser Belchen at an altitude of 986 metres and draining into the Lauch. It is situated in a less wild type of scenery than the tarns of the main ridge, and was the first to be used as a reservoir. It was dammed by Vauban in

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1702 to supply water for the canal which he constructed to join Ensisheim and Neu Breisach. Vauban's dam was made of wood and earth, and raised the lake-level 82 ft. In 1740 it burst, and the whole valley of the Lauch was devastated, the town of Gebweiler being preserved from destruction only by the walls which at that date still surrounded it. In 1850 the manufacturers of Gebweiler undertook to reconstruct the dam, and the present construction raises the lake-level 36 ft. and retains 8·8 million gallons of water.

The remaining corrie-tarns belong to a different group, and are situated in the drainage-area of the Doller.

The Sternsee (Lac de Perche) is a circular basin 11 acres in extent, with a depth of 56 ft. It lies 984 metres above sea-level among the crags of the Gresson, and is raised 10 ft. in level by a dam 130 ft. long. The quantity of available water is 48·5 million gallons.

The Neuweiher are two small tarns lying in the adjacent corrie to the Sternsee. Their areas are 10 and 2·7 acres respectively; their height above sea-level 824 and 804 metres. Dams, 164 and 263 ft. long, raise their surface-levels by 40 and 16 ft. respectively, and their total content of available water is 71·5 million gallons.

The Lachtelweiher, the last of this series, lies on the north slope of the Bärenkopf, on the south side of the Doller valley. Its dam dates from an early period; it is 200 ft. long and 16 ft. high, and raises the lake-level 10 ft. The area of the tarn is 5·7 acres, its altitude 740 metres, and its available water-content probably about 1½ million gallons.

Of the Vosges valley-lakes few have survived. Thus the upper Thur valley once contained a magnificent series of lakes, some of which might be reconstituted by means of dams, since the meadows which now represent their bottoms are not much built over. The only valley-lake now existing in its natural form on the Alsatian slope is the Sewensee (Doller valley), which time had reduced to a mere pool in the middle of a peat bog. The neighbouring Alfeldsee, which lies close under the summit of the Bâlon d'Alsace, has been made into a large and valuable reservoir at an expense (four-fifths borne by the State) of £27,500. There are two dams, connected by a natural rock mound: one is 240 ft. long by 39 ft. 6 in. high, 22 ft. 6 in. thick at the bottom and 3 ft. 3 in. at the top; the other,

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837 ft. long, 76 ft. high, 109 ft. thick at the bottom and 13 at the top. The whole dam is over a quarter of a mile in length. The lake, 22 acres in area, is entirely artificial; its content is 220 million gallons. The water, beside being used for industry, irrigates some 2,500 acres of pasture. The drainage area is 1,300 acres, and the amount of water annually received by the reservoir is 2,200 million gallons. The neighbouring Lerchenmatt has been also turned into a reservoir, but no details are available.

Another lake of the valley type which has been artificially enlarged is the Lauchensee, situated at the head of the Lauch valley, on the slopes of the Treekopf. It lies 940 metres above sea-level, and its area, as increased by damming, is 27 acres. The dam is 820 ft. long, 89 ft. high, 56 ft. 6 in. thick at the bottom and 13 ft. at the top; it was erected at a cost of £44,000, of which £38,000 was paid by the State, the remainder by the town and manufacturers of Gebweiler. The available water-content is 193·5 million gallons.

We have now enumerated all the lakes on the Alsatian slope of the Vosges. It will be observed that the total available content of those which have been dammed amounts to 1,027 million gallons. It must be confessed that this is not a large figure in comparison to the industrial requirements of the district. The towns of the Vosges valleys, not to mention those of the adjacent plain, require great quantities of power, and the resources of the Vosges ought to be fully exploited. The fact is that the scanty rainfall on the eastern slopes of the Vosges is in any case discouraging to the adoption of water-power on a large scale.

There remain, of the Vosges series, the three French valley-lakes of Retournemer, Longemer, and Gérardmer, all in the Vologne valley. The first is only a small tarn at the very head of the valley; the other two are large lakes, much larger than any others in the Vosges. The lake of Gérardmer is 660 metres above sea-level; it is about 2,200 yds. long by 850–1,000 broad, and about 284 acres in extent. Its greatest depth is 115 ft. It owes its existence to a moraine at its upper end—the original lower end of the valley—which rises to a height of 100 ft. above the surface of the lake.

The Longemer (210 acres) is about the same length as the preceding, but its width is only about a quarter of a mile and its depth about 97 ft. It lies at 746 metres above sea-level.

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The Retournemer, 780 metres above sea-level, is only some 300 by 200 yds. in extent and 35 ft. deep.

On the west side of the Vosges no attempt has been made to conserve the water-power. This is doubtless due in part to its abundance; the streams are all full and rapid in contrast to the meagre and often dry streams of the Alsatian slope, and users of water-power have always been content with tapping the rivers from point to point along their course. On the other hand it has long been a general complaint that the water-power available is too intermittent and inconstant for industrial purposes; and its value might be increased by the creation of reservoirs. For these, however, there is less room than on the Alsatian side, owing to the denser population of the high valleys.

The Sundgau Lakes

The western Sundgau contains some 230 lakes, with an aggregate area of about 800 acres, or an average area of about 3½ acres each. They owe their origin to subsidences in the diluvial gravel, which, being lined with impermeable loam, created lakes. Such subsidences naturally tended to occur in chains along a valley-bottom, and hence the lakes are almost always found in series. The lakes of the Sundgau, even more emphatically than those of the Vosges, owe their continued existence to human labour, for though they were apparently all at one time natural, the loess in which they lie is too soft to resist erosion for long, and their natural dams have in every case been worn through and replaced by artificial ones.

The Belfort Lakes

The valley of the Savoureuse above Belfort and below Giromagny contains a curious little lake district about 6 by 4 miles in extent. It is triangular in shape, the slopes of the Vosges forming two sides (with Giromagny in the centre) and the Jurassic limestone ridge which passes to the north of Belfort the third. The subsoil here is Permian, but the surface consists of Quaternary deposits, and the lakes seem to be due to glacial action on these deposits. Some of them, in the west, are of considerable size, the largest being a mile in length. It has been already pointed out (p. 46) that these lakes, by forming an obstacle to the north of Belfort, increase the military importance of that town.

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Lakes of the South-western Vosges Plateau

From the ridge which culminates at its south-eastern end in the Bâlon de Servance a plateau, furrowed by parallel valleys, falls gently away into the Burgundian plain. This plateau, a rough square 16–18 miles each way, whose corners lie somewhere near Remiremont, the Bâlon de Servance, Lure, and St. Loup, is—especially in its south-eastern half—a perfect network of lakes. Their average size is about the same as that of the Sundgau lakes, or even less; but they are extremely numerous. There are certainly at least 500 of them, mostly lying in a strip of country measuring 15 by 9 miles, in which they run on an average about 3 or 4 to the square mile.

Like the lakes of the Sundgau, these lie not in the river-valleys but on the plateau. They are, moreover, often (though not in the majority of cases) arranged in series. A remarkable feature of their distribution is the fact that they extend up to the very summit of the plateau, several lying on the actual crest of the ridge overlooking the Moselle valley.

Lakes of the Lorraine Plateau

These lakes occur in the flattest parts of the Lorraine plateau, where the soil is impermeable and the relief favourable to their formation. They are consequently to be found: (1) in the Saulnois and adjacent districts, where the clayey Keuper retains the water and the country is very flat; (2) in the Woëvre, where the Oxford clay produces the same effects.

The lakes of the Saulnois are generally said to have been caused by subsidences in the surface due to the disappearance (through the agency of water) of underlying salt or gypsum beds. If this explanation is correct, it links up these lakes with those of the Sundgau, which are also due to the formation of pockets in an impermeable surface soil by disturbances beneath it.

Like the Sundgau lakes, again, those of the Keuper district are now artificial. It is doubtful whether the larger ones ever extended naturally over the whole area which they now occupy; several have certainly been enlarged from time to time since the fourteenth century, when they are first known to have existed, by increasing the size or altering the situation of their dams. The method according to which they are alternately fished and cultivated is explained in Chap. XII (p. 299). It need only be added that they also serve as reservoirs for water-power

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in a district whose flatness makes the ordinary course of the rivers almost useless for this purpose; and, what is still more important, they hold up water which would otherwise flood the flat and low-lying valleys.

These lakes are very numerous and are in many cases extensive, so that in the aggregate they cover a large area. On the other hand they are very shallow, being in most parts only a few feet deep, and very irregular in outline. They are as a rule of a 'starfish' shape, having been formed in basins whose radiating valleys, when the lake is full, become long and narrow creeks. The three largest are the Gondrexange lake, the Linderweiher, and the Stockweiher.

The Linderweiher lies east of Dieuze, on the head-waters of the Seille. It is in area the largest of all (2,270 acres in extent), but is only 10 ft. deep at the deepest point, and its cubic content is only 212 million gallons, implying a mean depth of only 5 in. The dam is 1,475 ft. long. The carp of this lake, sold under the name of 'Rhine carp', are especially esteemed, and once fetched a high price.

The lake of Gondrexange lies in the Saar drainage-area, north of Avricourt, and serves as a reservoir for the Marne–Rhine and Saar canals, which it feeds by means of a self-regulating siphon; for this reason it is never drained. Its altitude above sea-level is 268 metres when full; its maximum depth 18 ft. Its area is variously given by different authorities as 1,170 (Ardouin-Dumazet) and 1,725 (*Das Reichsland E.-L.*) acres; its available content is 375 million gallons.

The Stockweiher lies in the drainage-area of the Saar, a few miles west of Saarburg. Its water-level when full is 258 metres above sea-level. It has a dam 1,000 ft. long, and its area is given by various authorities at 880 acres (*Das Reichsland E.-L.*) and 1,290 acres (Ardouin-Dumazet, &c.).

This district contains numerous other lakes of considerable size.

The lakes of the Woëvre are in many respects like those which we have just described. They are numerous, especially in the southern Woëvre, towards Commercy; but the largest are in the centre and north. The largest of all, the lake of La Chaussée, would bear comparison with the lakes of German Lorraine. In the Woëvre, as in German Lorraine, the larger lakes are shallow, artificial, and starfish-shaped.

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CHAPTER V

GEOLOGY

Geological History

The geological history of Alsace-Lorraine centres round that of the Vosges. This mountain system is not an isolated phenomenon; it was at its origin, and for long afterwards, continuous with the Black Forest to east and the central plateau of France to west. All these systems date back to the middle Carboniferous period, when a long chain of mountains, extending from the middle of France to the Böhmer Wald, rose from the sea. This mountain chain, at first very high, was formed of two groups of rocks. First, the already formed sedimentary strata of the Primary era, viz. Silurian, Cambrian, Devonian, and early Carboniferous rocks, all more or less metamorphosed by the pressure which they had undergone during the upheaval. Secondly, the underlying non-sedimentary rocks, mostly gneiss and granite.

The height of the mountain chain rapidly decreased, owing to subsidence below and erosion above, and during the later Carboniferous period, when coal-measures were being formed in the landlocked lagoons between the mountain ranges, the whole region was steadily sinking back into the sea. When the Permian was deposited most of the district was already under water, and by the middle of the Triassic period the submergence was complete. The later Triassic and all the Jurassic formations were deposited in a continuous sheet over all this part of Europe.

Towards the end of the Jurassic period a rise began. A dome-shaped height, of no great elevation, emerged from the sea and gradually rose throughout the Cretaceous period. The later Jurassic strata began to be weathered away from its summit, which took the form of a plateau sloping down in all directions from a point somewhere between Strasburg and Bâle. This elevation was the only disturbance that took place during the Secondary period; but the Tertiary, which saw the upheaval

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of the Alps, extended its effects to our district. The shock which elevated the Alpine chain threw the Jurassic plateau south of Belfort into a series of violent undulations. These waves broke, as it were, against the solid shore of the Vosges–Black Forest dome ; but they shattered it in the process. The whole dome was split up through the centre by a number of cracks, and its highest part began to sink unevenly. This subsidence created a rift running north and south and separating the Vosges on the west from the Black Forest on the east. These two halves of the plateau tilted at the same time, so that their broken edges stood up to form watersheds, their outward flanks sloping down to form respectively the terraces of Lorraine and Swabia. Erosion along the lines of greatest elevation was now accentuated, and the remaining Jurassic strata disappeared from all the eastern part of Alsace-Lorraine, to be followed by the upper strata of the Trias. Where the elevation was greatest, in the southern Vosges, the whole Triassic series disappeared, and erosion laid bare the face of the ancient mountain system that had stood here in the Carboniferous period. But in the lower northern Vosges the process was less violent ; the upper Triassic strata were indeed removed, but the red sandstone of the lower Trias was left and continued to mask the features of the primary mountain system, which is still buried beneath it.

At the same time the rift-valley where the Rhine now flows continued to sink, and was filled up with immense masses of river-gravels and marine and freshwater deposits, which covered the sunken blocks of the splintered Vosges–Black Forest massif and filled up their irregularities. Thus was produced the Rhine plain, at times an arm of the sea, at times an inland lake with its outlet to the south, sometimes (as during the Miocene) dry land.

Towards the end of the Tertiary the climate became colder and an ice-sheet developed on the Vosges. The whole mountain system was heavily glaciated in this and the early Quaternary period, and owes to this fact many of its most characteristic topographical features. The close of the glacial epoch was marked by an enormous increase in the volume of all the rivers, producing the ' diluvium ' or river-gravel which encumbers the plain in vast masses. It is most prominent in the Rhine plain, but there are great quantities in Lorraine, where it forms the *terre blanche*, arid platforms standing high above the level of

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the present rivers. The Rhine at the beginning of this period flowed through the Gap of Belfort and debouched into the Mediterranean; but later a subsidence to northwards tilted the Rhine plain in the opposite direction, and the river took up its present course.

The same period—the early Quaternary—saw the deposition of the very finely powdered loess which characterizes all the more fertile parts of the Rhine plain. This formation is generally believed to have its origin in glacial trituration, but to have been deposited in the present place by the action of wind. Appearing as it does in a regular blanket of even thickness, modelled into the relief of the country which it covers, it seems more likely to have been deposited by dust-storms than by the agency of water or ice.

Subsequent history merely records the formation of modern alluvia—gravels, sands, peat, &c.—and the progressive deepening of the river-valleys.

Distribution and Character of Rocks

It will be readily inferred from the foregoing sketch of geological history that the geology of Alsace-Lorraine centres round the north-and-south axis of elevation which forms the watershed of the Vosges. East of this line a number of huge faults, with an aggregate throw of several thousand metres, have given rise to the abrupt eastern face of the Vosges falling into the Rhine plain; west of the same line the level declines gently over the Lorraine plateau, and successive strata appear, of progressively recent date as they recede from the watershed. Thus is produced the distribution of rocks in belts or terraces which is so characteristic of Lorraine. The resulting topography is described in the earlier chapters; here it will be sufficient to add some notes on the general character of the formations concerned.

The primitive crystalline rocks include two groups, the gneiss group and the granite group. Of the gneiss some is compounded with mica, some with hornblende. The flaky structure of the gneiss shows a very decided dip towards the north-west, the strike of the beds being north-east and south-west. The Vosges gneiss, which on the Alsatian side is confined to the district between Walbach in the Münstertal and Urbeis in the Weilertal, belongs to two different horizons: the older series,

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in the south, is brown and dark grey, resembling mica-schist, while the later, about Markirch and Urbeis, is of various types, often containing graphite, hornblende, or garnets. The white 'marble' of St. Philippe, south of Markirch, belongs to the same group as the gneiss.

The granite group plays a very important part in the structure of the High Vosges. Almost the whole of the southern Vosges is composed of granite, its only competitors of any importance being gneiss, the greywackes of the Lower Carboniferous, and some trachyte. Many varieties of granite are distinguished; the greater part is porphyritic, with large crystals of felspar and considerable masses of hornblende. To the same group of rocks belong various kinds of porphyry, diabase, &c.

A transitional group between the basic gneiss and the sedimentary rocks of the Primary period is found in the form of a group of very hard stratified rocks in the neighbourhood of the Weilertal, forming precipices, and in character intermediate between gneiss (often resembling porphyritic granite) and metamorphic slate or hornstone.

The Primary formations are scantily represented. The lowest horizon is that of the Weiler slates, a dark grey-green or blue-black formation containing much quartz and mica, much metamorphosed into hornstone by the neighbouring intrusion of granite. These slates belong to the Cambrian period and contain no fossils. The Steig slates, of slightly later date, are true clay slates with hardly any mica. Above the Cambrian slates in the Breusch valley come Devonian slates, conglomerates, and greywackes, with a little limestone and dolomite. These Devonian strata are, apart from the St. Philippe marble, the first which yield any minerals more valuable than road-metal and paving-stones; they are worked for slates and lime, and contain various ores of copper and zinc, besides limonite (iron-ore), all once extensively mined.

The Lower Carboniferous covers a large area in the southern Vosges. Most of the Alsatian Vosges south of Münster belong to this series, which reappears in scattered patches on the French side of the frontier, and forms many of the chief peaks, such as the Grosser Belchen, Rossberg, Kahler Wasen, and Rother Wasen. At Gebweiler, Thann, and Sentheim it forms practically the whole of the mountains and runs down to the level of the plain. The rocks concerned are mostly grey-

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wackes, with some slates, especially in the lower strata. These are interrupted by some very thick dykes of eruptive rock, mostly porphyry.

The coal-measures of the Upper Carboniferous occur below the surface in Lorraine at Kleinrosseln and Spittel, on the northern frontier near Saarbrücken; they are here a continuation of the Saar coalfield, and have been traced south-westward across the French frontier as far as Pont-à-Mousson (see further, Chap. XIII).

In the Vosges they occur at the surface in several places, e.g. St. Pilt, Rodern, Diedolshausen, and Hury. The seams of coal in these formations are mostly thin and of no great value. Coal-mining was once carried on at Lach (Lalaye) west of Weiler; here are five seams, occurring in grits and conglomerates. More important are the deposits north-west of Belfort on the edge of the Vosges; there are several collieries in this region.

Permian occurs in three main deposits: round St. Dié, north of Belfort, and near Weiler. At all these places it was deposited in hollows in the gradually sinking mountain range, and, being softer than the crystalline rocks surrounding it, has been largely removed by erosion since the massif emerged again. The depressions of St. Dié and of the Giromagny valley near Belfort owe their origin to this fact, and are thus the counterpart of similar depressions already existing before the Permian was laid down. There are also fairly extensive deposits farther north, near the Donon and at Lützelhausen. The rocks are mostly sandstones, with some limestones, shales, and dolomites.

Secondary formations are very widely represented, forming the whole of the Lorraine plateau and the northern half of the Vosges, and this although the Trias and Jurassic are the only formations concerned, Cretaceous being entirely absent.

Of the Trias the Bunter is the most important. It extends all over the northern Vosges and in a wide belt forming a transitional area between the Lorraine plateau and the High Vosges; and, in addition, scattered occurrences are found on certain summits of the eastern Vosges—Ungersberg, Frankenburg, Hohkönigsburg, Tännchel, Königsstuhl, Hohneck, &c.—from which it has not yet been removed by erosion, and also in the Vosges foothills at Belfort, Thann, Gebweiler, &c.

The rocks of this formation consist almost exclusively of

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sandstones, white, yellow, and red. The white is rich in kaolin; all strata contain pebbles of quartz, granite, and porphyry. The red is especially noted for its tendency to weather into vertical cliffs and strangely shaped rocks, isolated towers, overhanging blocks, &c. The upper strata are in general purplish-brown or dark red, and contain beds of dolomite.

The harder beds are useful for building-stone, and are freely quarried for this purpose, the quarrying industry reaching a considerable scale in the Zorn valley, near Pfalzburg, at Gebweiler in the foothills, and at many other places. The finer qualities are noted for carved work. Lead-ore (especially at St. Avold), and in places copper-ore, are found.

The Muschelkalk, or middle group of the Trias, extends from the Faucilles, in the extreme south-west, in a continuous belt north-eastward to the Bavarian Palatinate frontier, where the commencement of the Saarbrücken anticlinal bends it back westward to St. Avold and Bolchen (Boulay); after which it turns north again and runs down the Saar valley. In Alsace proper—as opposed to the portion of the above belt lying in 'Alsatian Lorraine' near Rohrbach—it is confined to the Vosges foothills.

It consists mostly of hard limestones, used for lime-burning and as flux in blast furnaces; it also contains some gypsum, and clay of which tiles are made.

The Triassic series closes with the Keuper, which extends over a vast belt of eastern Lorraine, and reappears in the Vosges foothills between Flexburg, Walkenheim, Ingweiler, and Maursmünster. In Lorraine, however, it is much masked by the diluvial deposits of the ancient Vosges rivers. The lowest beds are dolomitic limestones, with some marl; the middle are very varied, but include the famous salt and gypsum beds, and other marl beds, as well as grits. At the top come the Rhaetic sandstones and red clays.

The Jurassic formations appear over the whole of western Lorraine, in the Vosges foothills, and in the extreme south of Alsace in the neighbourhood of Belfort and Ferrette. The lowest group, the Lias, contains limestones, clays, and sands (blue marls and shaly limestones being especially common). The limestones are worked for hydraulic cement and concrete, especially near Zabern; the clay of the middle Lias is in many

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parts of Lorraine used for tiles. A little building-stone is also found, especially in the extreme north of Lorraine.

The next main group of Jurassic strata is the series of oolites and marls known in Germany as the Dogger beds. These are important in Lorraine. The Bajocian oolite not only contains the rich deposits of *minette* iron-ore, but it forms a steep escarpment traversing the whole length of the country from Thionville in the north to Langres in the south, the first (after the Vosges) of the great natural ramparts which defend Paris from the east. These oolites are extensively worked for building-stone. The Oxford clays, which follow next, contain no minerals of much value, though they are here and there exploited for tiles. The Corallian limestones form another great rampart or escarpment, the Côtes de Meuse, and are followed by a succession of marls and limestones (Kimmeridge and Portland beds), in which Lorraine comes to an end.

The occurrences of Jurassic in the south of Alsace are very much smaller, and belong to the folded region and the Jura proper. They are described in Chapter IV.

Tertiary formations are almost entirely confined to the Rhine plain, of which they occupy the whole, but are almost everywhere covered by Quaternary deposits. Eocene is rare, and includes some limestones ; some clayey formations containing lignite, which has been worked more for the pyrites it contains than for fuel ; and some deposits of so-called ' bean ore ', an oolitic iron-ore found in pockets in the Jurassic limestones. This ore was at one time extensively mined and highly valued, both in Alsace and at various points on the Briey plateau. Miocene deposits are absent, Oligocene and Pliocene fairly common.

The Oligocene includes limestones (a good deal quarried at Brunstatt and elsewhere) and marls, containing gypsum, rock-salt, potash, and petroleum, the last two of great industrial importance ; lignite seams are found here and there. The so-called ' fish-shales ' of Altkirch and elsewhere are middle Oligocene. Fuller's earth is also found.

Pliocene is represented by thick deposits of clay, sand, and gravel ; it contains clays used for pottery, &c., and fuller's earth. The boulder-clay of Epfig and Dambach, with large masses of sandstone, is a Pliocene deposit. The formations of this period are mainly found in Lower Alsace.

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Quaternary formations are of very extensive occurrence. The early Quaternary or diluvium comes from two sources: the Rhine and the Vosges. The earliest diluvial deposits, alike of Alsace and of Lorraine, are almost entirely Vosges, since at this period the Rhine traversed only the extreme south of Alsace, escaping through the Gap of Belfort, and left its diluvium in a line running from Altkirch down the valley of the Doubs. At the end of this earliest diluvial period the Rhine changed its direction and began to deposit the gravels which still follow its course.

The Rhine diluvium occupies roughly the strip of country between the Rhine and the Ill. West of this the Vosges diluvium begins. The Hart is thus formed of Rhine gravel, the Ochsenfeld of Vosges deposits, being in fact the delta of the Thur. The only mineral of this period is the so-called Blättelerz iron-ore, which once, in Lower Alsace, gave rise to a considerable industry.

The Plain of Lorraine is freely scattered with large diluvial deposits brought down from the Vosges. As in Alsace, these form arid stretches of gravelly country on which nothing but timber will grow, and that of a poor quality. In the Moselle valley the diluvial terraces are about 70 metres above the present bed of the river.

In the Vosges valleys the early Quaternary is represented chiefly by glacial remains. The moraines of the Thur valley are especially remarkable.

The most interesting deposit of this period is the Alsatian loess, which covers the greater part of the Sundgau, the Kochersberg, and the Vosges foothills.

The alluvial deposits are of little importance. They include the present valley-bottoms, and only in the Moselle round Metz attain any large area. They also include the peat of the mountain-tops. The alluvion of the Rhine contains gold, which was formerly washed; this industry has now disappeared.

Eruptive basalt occurs much less freely in Alsace-Lorraine than in the Palatinate to northward or the Grand Duchy of Baden to eastward. It is confined to a few isolated occurrences such as the Côte d'Essey in the Lorraine Plain and a few sites in the Vosges foothills. All these occurrences date from the disturbances of the Tertiary epoch.

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CHAPTER VI

CLIMATE

WHILE Alsace-Lorraine is near enough to the Atlantic seaboard to be affected by its climatic influence, this influence reaches it only in a modified and weakened form. To a French observer therefore the climate of Alsace-Lorraine appears to belong to the continental type; while a German observer sees in it an example of the Atlantic seaboard climates. It is in point of fact intermediate between the two. The Atlantic influence is less conspicuous than in most parts of France, but much more so than in central Germany; and to it are due directly or indirectly some of the most conspicuous climatic features of Alsace-Lorraine—the predominant winds, the high rainfall of the Lorraine plateau and the Vosges, and the mild winters of the Alsatian plains. To the same agency is ultimately due a characteristic phenomenon in Alsace, viz. the belt of low cloud or fog which often fills the Rhine plain and the Vosges valleys on winter days, while the summits of the mountains rise above it in a clear sky and enjoy a considerably higher temperature than the plain.

It may be remarked that the curve of atmospheric pressure throughout the year follows in general that of temperature, while the curve of atmospheric moisture goes for the most part in the opposite direction, the warmest months being the driest; but the latter observation does not apply to the high mountains.

TEMPERATURE

The Rhine plain is the warmest part of Alsace-Lorraine. Its mean yearly temperature varies according to the locality between 50·3° and 49·3° F.; while on the Lorraine plateau the highest mean yearly temperature reaches only 48·4°, and means of 47–48° are common. In the Vosges foothills the temperatures are high, in sheltered places quite as high as in the plain; higher up in the Vosges valleys the annual mean is about the same as on the Lorraine plateau, and on the summits it is about 37°.

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The yearly cycle of temperature for the Alsatian plain runs from about 33°, the mean temperature for January, to 67° or 68°, the mean for July. The highest summer mean (67·8°, monthly mean for July) is recorded at Colmar; the mean of Strasburg for the same month is 67·1°, of Mulhouse 65·5°. December and January have the lowest means, January being everywhere slightly the lower of the two (33·1° at all three stations).

The Vosges foothills have a slightly flatter curve than the adjacent parts of the plain ; that is to say, they are about 0·5° warmer in winter and 1° cooler in summer. The July mean at Gebweiler is only 66·4°, while its January mean is 33·6°.

In the Vosges valleys the temperatures are everywhere lower, and the curve again tends to be flatter. Here, at such places as Münster, the mean for December and January is 32° ; for July 63·1° On the higher slopes of the Vosges the same tendencies continue to operate ; all the temperatures become lower, but the summer temperatures fall more than the winter, so that the annual curve becomes progressively flatter. Finally, on the summit of the Grosser Belchen the mean temperature remains below freezing-point from early in November till the beginning of April ; the lowest monthly mean (24·8°) is registered in February, the highest (50·9°) in July and August. Thus the minimum is only 8·3° below that of Colmar, the maximum 17° below. It may also be observed that at the highest stations the maxima and minima occur a fortnight to a month later than in the plains.

The temperature-cycle of the Lorraine plateau resembles that of the Alsatian plain, but in general the readings are all lower. The highest means occur at low and sheltered sites like Metz (January mean 33·8°, July 64·6°) ; on the true plateau the readings are all lower, and the monthly means vary between about 30° or 31° in January and 61° or 62° in July. All over Lorraine the mean summer readings are about 2–3° lower than those of Alsace, while the winter temperatures are seldom lower, and often higher. Thus Metz is 3·2° colder than Colmar in July, but 0·7° warmer in January. This comparative flatness of the temperature-curve in Lorraine is due to the greater Atlantic influence on the climate.

The mean range of temperature in Alsace is about 31° as against 27° at Paris and 24° in London. But though the mean range does not differ very much from that of countries farther

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west, large aberrations from the mean are more common in Alsace-Lorraine than in other French provinces or (*a fortiori*) in England; and Lorraine in particular has the name of a country where heat and cold are alike more violent than in the less continental parts of France.

Local Distribution of Rainfall

Alsace-Lorraine includes two north-and-south belts of rainy, and two of less rainy, country. This follows naturally from its orographical features. The plateau rises rather abruptly on the west from the flats of the Paris basin, and then, after a comparatively level stretch, rises again to the Vosges, which fall steeply into the Rhine plain.

The moisture-laden west winds thus find two obstacles which cause them to rise and precipitate their moisture: the Argonne–Barrois heights on the west, and the Vosges on the east. They strike the former after crossing the Paris basin at a low level, and, ascending, chill rapidly and produce a high rainfall all over that part of the Lorraine plateau which lies west of the Meuse. But after crossing the Meuse they meet with no further obstacle for a time, and consequently the amount of rain diminishes perceptibly for some distance to the east. After a space, however (shorter in the south than in the north, because of the greater massiveness of the Vosges chain in the south), they begin to rise once more as they encounter the first slopes of the Vosges, and the amount of rainfall at once increases. The Vosges thus form a second belt of rainy country, and the Rhine plain a second belt of dry. But the Rhine plain as a whole is very much drier than any part of the Lorraine plateau. From Mulhouse to Strasburg it has an extremely low rainfall, the moisture of the west winds having been almost all precipitated by the Vosges, which thus shelter the plains of High and Middle Alsace from rainfall and add greatly to their dryness and warmth.

Rain-belts can be distinguished running east and west as well as north and south. In the north a belt of high rainfall runs through the Ardennes and Hunsrück (Atlas, map 3, extreme top); then follows a less rainy belt, corresponding to a lower and less accidented strip of country, in which lie Metz, Saarbrücken, and Kaiserslautern; then a very rainy belt, with the highlands of the Barrois at one end and the High Vosges at the

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other; and lastly, another less rainy belt, the low country of the Burgundian plain and the Gap of Belfort.

It is generally found that where one district has an exceptionally high rainfall the district immediately to east of it has an unusually low one, lying as it does in the 'rain-shadow' of the former. (The Vosges and Rhine plain, as already observed, are the most conspicuous instance.) The converse of this rule is also true. Gaps like those of Zabern and Belfort allow moisture to pass through without being precipitated; and thus the Sundgau and the Lower Alsatian plain have a relatively high rainfall, which has important results upon their economic life.

Turning to the figures, the Rhine plain, in the region where the 'rain-shadow' of the Vosges is deepest, has barely 20 in. of rain in an average year. This applies to the district immediately adjoining Colmar; farther east, as well as both north and south of this region, the rainfall in the plain is two or three inches higher. In the Kochersberg, where the Vosges 'rain-shadow' begins to lose its effect, the average is 25 in.; in the Lower Alsatian plain it is about 28–30.

Southward the increase is even more rapid: at Mulhouse the mean annual rainfall is about 28 in., at Altkirch about 35, and in the southern Sundgau about 30.

In the High Vosges there are regions where the average rainfall is about 100–120 in. These are confined to a small area extending roughly from the Bâlon d'Alsace to the Hohneck, and stretching a little way west from the main watershed but hardly at all eastward. East of the main ridge even such stations as the summit of the Grosser Belchen have an average of little over 60 in.

From the Giromagny depression on the south to the St. Dié depression on the north the rainfall is almost everywhere over 50 in. The St. Dié depression is a gulf of lower rainfall—about 35 in.—projecting into the heart of the High Vosges; farther north, round the Donon, the rainfall increases again to 50–60 in. But where the mountains drop to the Gap of Zabern the rainfall drops too, and it nowhere again exceeds 35 in. till the Hunsrück is reached.

As in the Vosges, so in the Lorraine plateau the rainfall is highest in the south. In the hilly sub-Vosgian district round Épinal it is about 40 in.; westward it declines gradually to about 30 on the Faucilles, and then rises to 40 again on the

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Langres plateau. The Messin and Moselle valley, as far south as Toul and Nancy, has the lowest figure of all Lorraine, sheltered as it is by the Jurassic ridges to westward; its mean annual rainfall is mostly about 25–26 in. Everything between this belt and the Vosges has a fairly uniform figure of 28–30 in.; the Woëvre and Briey plateau the same. Finally, the Côtes de Meuse, the southern Haye, and the Barrois have in general 35–40 in.

These are the main outlines; but in general the details of local rainfall are much affected by the details of relief. The hills of the Lorraine plateau almost always show a slight rise of rainfall, with a slight decline—sometimes a considerable decline—to eastward. Hence the value of their eastern slopes for vineyards and orchards.

Seasonal Distribution of Rainfall

All over the Alsatian plain May to October are wet months and the rest of the year dry. The maximum generally falls in June, the minimum in January. As a rule the rainfall rises from January to March, falls to a secondary minimum in April, then rises abruptly and remains high but irregular till October, after which it gradually declines.

In the Vosges the annual cycle is by no means so distinct as it is in the plain. The rainiest months appear to be as a rule October, December, June–July, and March; April, February, and August–September are generally dry. Roughly it may be said that the autumn is the wet season and the spring the dry.

In Lorraine the early summer maximum reappears. May, June, and July are rainy months, especially June; secondary maxima occur in October and, sometimes, March. January–February and April are the dry months, and late summer is also dry.

The whole area is thus dry in the late winter and in April, and wet in early summer; in the mountains this normal cycle is modified by heavy rains in the autumn and early winter. On the whole, however, the rainfall of a given year seldom corresponds accurately to the normal cycle, except perhaps in the Alsatian plain.

Snowfall

Over the greater part of Alsace-Lorraine snow is not to be expected between the end of March and the middle of November. In the Vosges the snow-free season is shorter (middle or end of May to middle of October), and on the summits shorter again.

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Thus at the Grosser Belchen station snow continues to fall till late in May, or even to the middle of June, and begins again any time in the first three weeks of September. The snow-free period rarely lasts five months on the summits, and it generally lasts a much shorter time. Sometimes no month is altogether snow-free at the Belchen summit.

In the Alsatian plain the snow season is longest near the mountains and shortest near the Rhine ; it lasts on average a few days longer at Colmar than at Alt Breisach. Up to the present time detailed observations of snowfall appear not to have been undertaken in Lorraine, and those taken in Alsace cover a few years only.

Winds

The generally prevailing winds are west and south-west. In sufficiently exposed situations these represent 50 per cent. of the whole, the only other frequent wind being the north-east. Local conditions of course strongly affect the direction of winds. Thus the whole Rhine plain is sheltered from west and south-west winds, and north and south winds here prevail; at Strasburg north and south winds are together 60 per cent. of the whole. In the Sundgau transverse winds from the south-east and south-west become frequent. On the Lorraine plateau west and south-west winds predominate, except at such places as Metz, sheltered from the west, where local conditions give rise to north and south winds.

The *Föhn* wind is an important climatic feature of Alsace. The west and south-west winds, after crossing the Lorraine plateau horizontally, rise on coming into contact with the western spurs of the Vosges, and, chilling, condense their moisture. On reaching the summit of the Vosges they begin to descend a precipitous slope, averaging some 3,000 ft. in height, in order to reach the valley-bottoms. The increase of atmospheric pressure to which they are progressively subjected in their descent warms them at a rate of 1° F. in every 150 ft., and this progressive warming checks the condensation of water-vapour. The result is a warm, dry wind, the so-called *Föhn*, in the eastern valleys and foothills of the Vosges, corresponding to the rain-bringing wind of the summits and western slopes. This *Föhn* wind is an important factor in the climate, and therefore in the agricultural life of Alsace.

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PART II

THE POPULATION AND ITS HISTORY

Characteristics, distribution, density, and variation of the population; languages and dialects; history from the Roman period to the present day.

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CHAPTER VII

POPULATION

Characteristics

Physical

From the remotest times Alsace-Lorraine has been the home of a mixed race. With the earliest prehistoric remains two types of skull are found—the long-headed (dolichocephalic) and a comparatively round-headed (mesocephalic) form. Even in the Bronze Age, though most of the cremated, and therefore fragmentary, skulls appear to have been short and round (brachycephalic), there is an admixture of the long type. In pre-Roman times the mass of the population seems to have been of the great 'Alpine' race, which prevailed throughout southern France, southern Germany, and Switzerland—a short but sturdy, dark, and round-headed people, with whom were mingled the fair, tall, long-headed warrior Celts as a dominant minority. How soon these were invaded by Teutonic tribes, also fair, tall, and long-headed, is not clear; recent German writers hold that the plain of Alsace in Caesar's time was occupied, not by true Gauls, but by the Triboci and Rauraci, Germans who became celticized only in the first century before Christ. But the mass of the Gauls who held Lorraine and the Vosges were not tall, fair, and long-headed. Even in the late Roman Empire Alsace was partly occupied by people of the older (dark and round-headed) type, as shown by the remains in the late Roman cemetery at Strasburg, where of 61 measurable skulls, 14·7 per cent. were long, 39·3 per cent. were mesocephalic, and 46 per cent. round-headed.

The Teutonic Alamanni, who settled the plain of Alsace in the fourth century A.D., and the Teutonic Franks, who colonized northern Lorraine and overran the rest of the country in the fifth century, are not easily discriminated by their physical remains. All row-graves of the Merovingian age show similar forms of head. At Liverdun on the Moselle, in Frankish

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interments, the skulls are nearly dolichocephalic : at a contemporary cemetery near Strasburg skulls presumably Alamannic have been found in the proportion of five of the long type to three others. But the mass of the population remained round-headed in spite of admixture. In ancient charnel-houses among the Vosges, between Zabern and Kaysersberg, which have been searched for evidence, out of 700 examples only 1·70 per cent. of the skulls are long, 13·71 per cent. are of middle type, and 84·56 per cent. are short and round. The measurement of skulls of the modern population appears to show similar results. Throughout Upper Alsace to 1·4 per cent. of long heads there are 19·2 per cent. of middle type and 79·4 per cent. short to very short. In Lower Alsace and German Lorraine there are rather more long-heads—2·6 per cent. to 10·5 mesocephalic and 86·9 short to very short. In French Lorraine the round-headed ' Alpine ' race is greatly preponderant.

The characteristic face is ' leptoprosopic '—long and narrow, with small nose and eye-sockets set rather high, making a low but broad forehead ; the cheek-bones and jaws are strongly marked.

Brown eyes are seen frequently in the town of Strasburg and in the *Kreise* of Schlettstadt, Thann, and Mulhouse. Blue eyes are more common in and around Metz and in the *Kreis* of Saargemünd. In 1886 over 200,000 schoolchildren in German Alsace-Lorraine were classed as follows :—in Upper Alsace 28·5 per cent. had blue eyes, 32·5 grey, and 39 brown ; in Lower Alsace 28 per cent. blue, 33 grey, and 39 brown ; in Lorraine 30 per cent. blue, 34 grey, and 36 brown. In Lower Alsace fair and dark hair is found in nearly equal proportions ; in Upper Alsace about 45 per cent. of blonde to 54 of brown or black, the remaining small percentage is reddish ; in German Lorraine about 49 per cent. of blonde to 51 of dark. Taking hair and eyes together, Upper Alsace shows the greatest proportion of the distinctly dark type (33·01 per cent.) and Lorraine least (26·63) ; of distinctly fair type Upper Alsace has 17·75 and Lorraine 19·18 per cent

The average height of men in Lower Alsace is given as 5 ft. $4\frac{1}{2}$ in., of women 5 ft. $0\frac{3}{4}$ in. The Lorrainers are rather shorter.

Alsace therefore, except in the High Vosges, classes with South Germany as to racial type, for there also the ' Alpine '

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(Celtic) race is mixed with the Teutonic stock. The High Vosges and French Lorraine are more purely Celtic. Northern Lorraine is of more mixed origin, owing to immigrations at various periods, which have varied the original Franco-Celtic population.

Throughout the Middle Ages the country was open to invasions, which must have left some alien blood among the population. The *Cosmographia* of Sebastian Münster, published at Bâle in 1544, describes the fertility of Alsace and notes the immigration of Swabians, Bavarians, Burgundians, and Lorrainers to help in the harvest. Soon after that date many Huguenots from France, and a few from Italy and Spain, settled at Strasburg. But the Thirty Years' War, ending in 1648, swept away a great part of the inhabitants. In 1695, when Alsace was recovering from the war, its population numbered only 245,997. Lorraine had a population of 400,000 early in the century, and it is said that of this number about three-quarters perished. The losses were made good, especially in the district between Dagsburg and Château-Salins, with Picards and Auvergnats brought in by the French. In the Vosges many Germans settled, partly as miners, partly as Protestant refugees from persecution. Remains of the armies which had occupied the country are supposed to have continued there, though the 'Swedish land' at Kleeburg in the northern Vosges was so called as dower of Catherine of Sweden, wife of a Count Palatine who had owned the lordship—not from a colony of Swedes. After France took possession of Alsace (beginning from 1634) there was a slight addition of French to the natives, continuing until 1870. Germans also had 'peacefully penetrated' Alsace-Lorraine. In 1861 their numbers in the Haut-Rhin (Upper Alsace) were 14,615, in the Bas-Rhin (Lower Alsace) 11,791, and in the department of the Moselle (German Lorraine) 15,884. Since 1870 the emigration of half a million of natives, partly replaced by Germans, Austrians, Swiss, Italians, Poles, and various foreigners, has modified the existing population; but the great mass of the ancient race survives. The German ethnographer, Otto Bremer, writing in 1899, after remarking that the strongest token of nationality is found in mental and moral disposition, adds: 'I believe that Celtic character can be traced on the Rhine to this day.'

The Celtic character in Gaul was the result of a mixture of

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two nations—the early, dark-haired cultivators of the soil, known for such by the sickles found in their graves, and probably descended from the Swiss lake-dwellers of the Stone Age, who introduced cereals and domestic animals into this part of Europe, and their conquerors, the tall, fair, warlike, and wandering Gauls. Together they formed a race of considerable civilization, being craftsmen in metals and enamels, in pottery, textiles, and basket-work; warriors of the war-chariots; builders of great forts and towns; makers of salt in the great 'briquetages'—vast ruins of salt-pans—in the Seille valley; tribes with social and political organization and a complex religion; later on, ready to assimilate Latin culture and Christianity. They have been described as 'enthusiastic, impulsive, quick-witted, versatile, vain-glorious and ostentatious, childishly inquisitive and childishly credulous, rash, sanguine and inconstant, arrogant in victory and despondent in defeat, submissive as women to their priests, impatient of law and discipline, yet capable of loyalty to a strong and sympathetic ruler' (Rice Holmes, *Caesar*, 14).

Not a few of these characteristics can be traced on the Rhine to this day. Many of them are shared by the people of Lorraine, though there are differences to be noted east and west of the Vosges.

Moral

Alsatians are described as a people in whom individuality is highly developed; independent, and at the same time sensitive; with strong religious feelings, but indeterminate in their theology; jocular and satirical in their talk, but hard bargainers. They listen to argument unconvinced and turn off discussion with a jest. They are industrious and versatile workers at husbandry and crafts, but loving diversion. Goethe in 1770 found that 'all Alsace danced'. Lovers also of good fare—their pastries and confectionery are famous—and of the good wine they make; and, at least among the mountains, where the Celtic element is strongest, fond of old tradition and their native folklore.

In Lorraine the people are more taciturn and reserved than in Alsace, but tenacious of individuality and resolute in character. In the wilder woodlands of the *pays de la Haye* they are half-savages according to their neighbours of the towns. The in-

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habitants of Rosières (north of Nancy) go by the name of 'wolves'. It has been remarked that at Vilcey-sur-Trey old family feuds are kept up, just as in the fifteenth century the feud between Neufchâteau and Charles the Bold was followed with bitterness for many years. The people of the Barrois are described as active and able for any sort of craft; not demonstrative, rarely excited, frank, and ready to forget quarrels; alert, ironic, ready with an answer; more inclined to criticism than to enthusiasm; honest business-men, brave soldiers, but with no imagination—or, if they have imagination, it runs to eccentricity. But they are highly individual, tenacious in each locality of old customs, old patois, old weights and measures, even after a century of the metric system; 'Gauls to this day' and with a Gaulish tendency to indulgence in drink. In the Woëvre they are hardworking and self-reliant, with no idealism or mysticism. Nearer the Vosges they seem to assimilate to the Alsatian character; but everywhere in Alsace-Lorraine there is the Gaulish self-centred individuality, the Gaulish humour, the Gaulish military and religious spirit, competence in handicrafts, and, if not imagination, the fancy that nearly replaces it.

The heroine and ideal of Lorraine is Jeanne d'Arc. At Domrémy, near Neufchâteau on the Meuse, the house where she was born is still a shrine of pilgrimage.

If the country has produced no great poets it has a wealth of popular songs and legends. If its artists have not been of the highest imaginative class they were great craftsmen—Claude Gelée 'le Lorrain' (1600–1682) born at Chamagne near Charmes and Bastien-Lepage (1848–1884) born at Damvillers in the Woëvre. In Bastien-Lepage's native district living is eked out by making compasses and mathematical instruments; in Claude's there has been an industry of *lutherie* (musical instruments) since the sixteenth century, with lace-making as elsewhere in Lorraine. In the north and east they embroider; the pearl-embroidery of Dabo and the white embroidery of Lorquin are especially famous. At Épinal, since 1796, there is a curious craft of *imagerie* (printed paper designs, hand-coloured in stencils). The glass-works of Portieux (near Charmes and Darney), the *cristallerie* of Baccarat, and the pottery of Lunéville are from the eighteenth century. At Arches in the Vosges there is an old mill for special hand-made papers.

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At St. Dié one of the earliest printing-presses was set up. In Dabo they distil valuable liqueurs from wild fruits; many places, like Bar-le-Duc, are celebrated for some unique confectionery. Straw hats, thread gloves, fine weaving, as well as the rougher industries of iron, salt and timber, occupy Lorrainers, and show their inheritance of Celtic craftsmanship.

The folklore of Lorraine is rich, but most of its types are not unfamiliar in Britain. At Rambervillers they carry the Yule-log round the house with *Noël* songs, and save pieces of its charcoal as amulets against lightning. In that district fountains are dressed at New Year, and the first-comer next morning sees her *futur* reflected in the water. On Twelfth Night they draw beans from a basket, or find them in a cake, counting the first for God, the second for the Virgin, and then round the party; whoever takes the black bean is ruler of the feast. A Good Friday egg, if kept, preserves from lightning, or, if eaten, from fever and madness; the belief in the cockatrice egg is still current. On the Sunday after St. John they light bonfires on the hill-tops; herbs gathered while the clock strikes midnight are magical; against witches each householder used to bring a faggot to the public square on St. John's Eve, and burn a cage full of black cats while the people danced round. At Remiremont the Whit-Monday procession singing the *Kyriolé* is a survival of the solemn dance of the lady canonesses and their officials. At Bouzemont (between Mirecourt and Épinal) there is a May Day procession of girls singing the May song and leaving posies with the donors of gifts for the Virgin. At Épinal on the evening of Holy Thursday boys float toy boats with lighted candles on the river, to the song of *Lé changolo, lé correlo, Pâque revièn*—'The meadows grow, Long evenings go, Easter is come Their joy to find For creatures dumb And humankind', and Valentines eat cakes together in the wood on the first Sunday in Lent. Much of this folklore goes back, in Lorraine as in Britain, to Celtic observances.

The Gaulish martial spirit, conspicuous throughout the Middle Ages, blazed again in the Wars of Napoleon, who found many volunteers in Lorraine. Five of his marshals were Lorrainers—Ney of Saarlouis (1769–1815), Oudinot of Bar-le-Duc (1767–1847), Gérard of Damvillers (1774–1852), Victor of Lamarche (1764–1841), and Molitor of Hayingen (1770–1849). The Alsatians, inheriting democracy from their mediaeval free

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towns, were stirred earlier by the Revolution and fought for the Republic. J. B. Kléber of Strasburg (1753–1800) was an architect before he became a famous general; it was he who was entrusted by Catharine II of Russia, formerly a pupil of Massevaux (Masmünster), with the rebuilding of the convent.

Alsace also has its celebrated artists—Martin Schongauer (1450–91) of Colmar and J. J. Henner (1829–1905) born near Mulhouse. It has a succession of local poets from the minnesingers and meistersingers to the dialect playwrights and songwriters of recent days. Being a border country it is a home of romance. Its inherited aptitude for craftsmanship is even a greater source of wealth than the fertility of its soil. More favoured by nature and the genius of art than Switzerland, it is less fortunate politically. The Alsatians were once the spoiled children of their circumstances. Their easier life left them, in former days, no chance to learn the severer lessons which taught the Swiss to gain the freedom which Alsace has always claimed, but not yet achieved.

Religion

In 1910 in German Alsace-Lorraine there were 1,428,343 Roman Catholics, 408,274 Protestants of various German Churches, 3,868 Christians of other denominations, 30,483 Jews, and 3,046 of other religions or unclassified.

The Roman Catholics, under the Bishops of Strasburg and Metz, are stronger in the Reichsland than in any other part of the German Empire. In *Kreis* Zabern alone there is a majority of Protestants, who form also a strong majority in Strasburg, though in the *Kreis* of Schlettstadt, historically a Catholic town, there are 5 Roman Catholics to 1 Protestant. In Lower Alsace as a whole Roman Catholics are about 62 per cent. of the population. In Upper Alsace they form about 84 per cent.; in Mulhouse they outnumber the Protestants by 6 to 1, in Gebweiler by 25 to 1, and in Altkirch by 44 to 1. In German Lorraine the proportion of Catholics is about 90 per cent.; Protestants are strongest in Metz town, which has more than 1 to 3 Catholics, and weakest in *Kreis* Bolchen, where there is only one Protestant to a hundred Catholics.

The Jews in German Alsace-Lorraine have declined steadily from 40,812 in 1871 to 30,483 in 1910. Of their whole number nearly half live in Lower Alsace, more than a third in Upper

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Alsace, and less than a fifth in Lorraine. They congregate in the larger towns, but spread over all the *Kreise*, though more thinly in the poorer districts.

Density of Population

The map titled 'Density of Population' is based upon the French census of 1906, the German census of 1910, and the French maps of 1912,[1] which give the figures of 1911 for towns and villages. Places of more than 2,000 inhabitants in 1911 are marked with circles proportionate to their size. The tints show the density of rural population, that is to say, excluding that of the larger towns. The darkest tint indicates 300 to 600 inhabitants to the square mile, the middle tint 170 to 300, the light tint 50 to 170, and the uncoloured spaces represent thinly inhabited country (mountains, forests, and poor lands) of less than 50 persons to the square mile, in the conditions prevailing shortly before the present war.

French Lorraine

In the three departments of the Meuse, Meurthe-et-Moselle, and Vosges (the territory of Belfort being taken later as French Alsace) the population follows the river-valleys, thinning out on the higher agricultural lands and disappearing in the frequent and extensive areas occupied by woods and forests. It groups most thickly in the iron districts of the extreme north and in the valley near Nancy; less thickly, but still with considerable density, in the south-east, where mountain-valleys afford water-power for industries. Nearly all the blank spaces in French Lorraine represent forest land.

The population of French Lorraine in 1906 was 1,227,540: that is to say, in the department of the Meuse 280,220, in that of Meurthe-et-Moselle 517,508, and in that of the Vosges 429,812. The average per square mile was in the Meuse 116·2, in the Meurthe-et-Moselle 253·8, and in the Vosges 188·5. As these last two departments have an increasing population, the figures must be enlarged to compare with those given later for the German Reichsland in 1910; and to estimate the conditions at the outbreak of the present war, local rise and fall must be taken into account. In the following list the figures per square

[1] *Carte de France et des frontières à 1/200,000, type 1912* (*service géogr. de l'Armée*).

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mile indicate the approximate averages of extra-urban population ; the populations of the towns are given in round numbers from the figures of 1911.

Department of the Meuse : arrondissements of

Montmédy, 85 per sq. m.—Montmédy (2,500), Bouligny (2,700).

Verdun, 95 per sq. m.—Verdun (21,700), Étain (2,900).

Commercy, 82 per sq. m.—Commercy (8,900), St. Mihiel (9,600), Lérouville (3,300).

Bar-le-Duc, 90 per sq. m.—Bar-le-Duc (17,300), Ligny (5,300).

Department of Meurthe-et-Moselle : arrondissements of

Briey, 160 per sq. m.—Briey (2,900), Longwy (11,100), Jœuf (9,600), Villerupt (8,600), Homécourt (7,000), Mont St. Martin (4,600), Longuyon (3,800), Hussigny (3,600), Jarny (3,400), Thil (2,500), Herserange (2,300), Réhon (2,000).

Toul, 100 per sq. m.—Toul (15,800), Écrouves (9,800), Foug (2,400).

Nancy, 215 per sq. m.—Nancy (119,800), Pont-à-Mousson (14,000), Dombasle (6,900), St. Nicolas (5,900), Laxou (4,800), Frouard (4,700), Champigneulles (4,300), Pompey (3,600), Maxéville (3,100), St. Max (2,900), Varangéville (2,700), Pont St. Vincent (2,600), Vandœuvre (2,300), Rosières-aux-Salines (2,300), Chaligny (2,100).

Lunéville, 115 per sq. m.—Lunéville (25,600), Baccarat (7,300), Cirey (2,700), Badonviller (2,100), Val-et-Chatillon (2,100).

Department of the Vosges : arrondissements of

Neufchâteau, 90 per sq. m.—Neufchâteau (4,000).

Mirecourt, 120 per sq. m.—Mirecourt (6,000), Charmes (4,100), Vittel (2,500).

Épinal, 140 per sq. m.—Épinal (30,000), Thaon-les-Vosges (7,300), Rambervillers (5,800), Golbey (4,200), Bruyères (4,500), Xertigny (3,500), St. Laurent (3,000), Bains-les-Bains (2,300), Nomexy (2,200), Hadol (2,000).

St. Dié, 190 per sq. m.—St. Dié (23,100), Gérardmer (10,400), Senones (6,700), Plainfaing (5,100), Raon-l'Étape (5,000), Fraize (4,300), Granges (3,700), Neuveville (3,400), Anould (3,200), Corcieux (2,000).

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Remiremont, 175 per sq. m.—Remiremont (11,000), le Val d'Ajol (7,600), La Bresse (5,700), Cornimont (5,600), Rupt (4,700), Saulxures (4,100), le Thillot (4,000), St. Maurice (3,100), Bussang (2,900), Vagney (2,700), Plombières (2,000).

The adjacent districts of France, included in the map of density, are similar in character to their neighbours. Those on the west have a scanty population grouped along river-valleys and interrupted by many forests ; those toward the east share the industrial circumstances of the Vosges. The following averages per square mile include the towns.

Department of Haute-Marne ; arrondissements of

Vassy, 114 per sq. m.
Chaumont, 76 per sq. m.
Langres, 93 per sq. m.

Department of Haute-Saône ; arrondissements of

Gray, 95 per sq. m.
Vesoul, 109 per sq. m.
Lure, 173 per sq. m.

Department of Doubs ; arrondissement of

Montbéliard, 219 per sq. m.

French Alsace

Adjoining Montbéliard and sharing in its industrial position, but partly owing its high population to immigration from German Alsace, is the territory of Belfort, the remaining fragment of the French Alsatian department of the Haut-Rhin. In 1906 it had 95,421 inhabitants, averaging (with towns) 406 to the square mile. Its rural population averages 260 per square mile, and its towns are Belfort (39,400), Giromagny (3,600), Grandvillars (3,100), Delle (2,600), Rougemont-le-Château (2,100).

German Alsace

The map of density shows that the population of Alsace is confined to a long north-and-south strip by the Vosges and the Rhine. Between Bâle and Mannheim no towns or thickly

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inhabited districts are situated on the river except near Strasburg, and Strasburg lies upon the river Ill, not, strictly speaking, upon the Rhine. Part of its life indeed is connected with transport from inland waterways to the navigable river below the town; but Strasburg owes more to the fact that it has always been a junction of roads near the chief bridge over a river otherwise difficult to pass. There are now six bridges between Strasburg and Bâle, but none of them have created towns; the ancient strategic importance of Breisach has left no mark. On the contrary the unhealthy marshes and poor lands of the Rhine plain disconnect two populous strips of ground along the edges of the hills on either side—that on the fringe of the Black Forest, and the still more marked line of vineyard and industrial towns on the rising ground along the skirts and in the valleys of the Vosges. Strasburg itself depends greatly on the fact that it is the head-quarters of German Government, but partly on the products of these inland Alsatian towns, for which it is the market and outlet. Mulhouse seems to stand out of this line that runs so markedly through Alsace; but it is placed on the edge of ground rising toward the Gap of Belfort, and separated from the Rhine by the almost uninhabited Hart forest. South-east of Mulhouse a group of modern towns around Hüningen approach the Rhine, but they are economically connected with Bâle rather than with Alsace. North of Strasburg a few Alsatian towns follow the river, but a strip of thinly populated country on the eastern bank again disjoins Germany from them, and the Rhine connects its banks only when it has passed beyond the northern limits of Alsace.

On the other hand the chain of the Vosges offers a barrier between Alsace and Lorraine, but less continuous and less forbidding than the Rhine. Industrial populations penetrate the valleys from either side and overrun the watershed, or are separated by only a few miles of easy hill-roads. In ancient times the Vosges formed a natural boundary; the frontier now is only political.

The following list gives the rural population to the square mile of the *Kreise* (= *arrondissements*) of German Alsace, and the towns or villages of more than 2,000 inhabitants, from the German census of 1910. The towns are grouped according to the cantons in which they are situated.

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UPPER ALSACE: *Kreis* Altkirch, rural population 191 per sq. m.—Altkirch (3,500).

Kreis Mulhouse (Mülhausen), rural population 155 per sq. m.—Mulhouse (95,000), Dornach (10,500), Brunstatt (3,600), Pfastatt (3,200), Lutterbach (3,000), Niedermorschweiler (2,300), Wittenheim (2,300), Habsheim (2,000), Riedisheim (5,700), Illzach (3,600), Rixheim (3,600), Hüningen (3,600), St. Ludwig (5,400), Blotzheim (2,600), Neudorf (2,500), Hegenheim (2,300).

Kreis Thann, rural population 160 per sq. m.—Thann (7,400), Bitschweiler (2,300), Alt Thann (2,100), Weiler (2,000), Masmünster (3,600), St. Amarin (2,200), Moosch (2,300), Sennheim (5,200).

Kreis Gebweiler, rural population 148 per sq. m.—Gebweiler (13,000), Bühl (3,300), Lautenbach (2,000), Sulz (4,800), Ensisheim (2,500), Rufach (3,800), Sulzmatt (2,500).

Kreis Colmar, rural population 153 per sq. m.—Colmar (43,800), Münster (6,000), Neu Breisach (2,800), Winzenheim (3,600), Türkheim (2,500).

Kreis Rappoltsweiler, rural population 129 per sq. m.—Rappoltsweiler (5,800), Bergheim (2,000), Kaysersberg (2,700), Ingersheim (2,700), Markirch (11,800), St. Kreuz (3,600), Leberau (2,000), Schnierlach (2,100), Urbeis (4,300).

LOWER ALSACE: *Kreis* Schlettstadt, rural population 159 per sq. m.—Schlettstadt (10,600), Kestenholz (2,500), Scherweiler (2,400), Barr (4,900), Epfig (2,200), Dambach (2,300), Markolsheim (2,100).

Kreis Erstein, rural population 215 per sq. m.—Erstein (6,000), Benfeld (2,600), Geispolsheim (2,200), Illkirch (6,500), Lingolsheim (2,300), Oberehnheim (3,900).

Kreis Molsheim, rural population 177 per sq. m.—Molsheim (3,200), Mutzig (3,300), Rosheim (3,100), Vorbruck (3,200), Wasselnheim (3,500).

Kreis Strasburg, rural population 222 per sq. m.—Strasburg (178,900), Neudorf (25,500), Ruprechtsau (10,000), Kronenburg (7,700), Königshofen (6,600), Neuhof (4,500), Grüneberg (4,000) (these seven towns form 'Greater Strasburg'); Schiltigheim (16,800), Bischheim (9,900), Hönheim (2,600), Eckbolsheim (2,300), Brumath (5,500), Hördt (2,900), Wanzenau (2,500), Weyersheim (2,000), Gambsheim (2,000), Hochfelden (2,700).

Kreis Hagenau, rural population 146 per sq. m.—Hagenau (18,800), Bischweiler (8,100), Sufflenheim (3,200), Herlisheim

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(2,200), Oberhofen (2,200), Niederbronn (3,300), Merzweiler (2,100), Reichshofen (3,000).

Kreis Weissenburg, rural population 213 per sq. m.—Weissenburg (6,700).

Kreis Zabern, rural population 174 per sq. m.—Zabern (9,100), Dettweiler (2,100), Buchsweiler (2,900), Ingweiler (2,400), Saarunion (3,100).

The total population, by the census of 1910, of Upper Alsace is 517,865; Lower Alsace, 700,938; together, 1,218,803. The average density of population, including towns, is in Upper Alsace 382 per square mile, in Lower Alsace 379; or, excluding towns of 2,000 inhabitants and more, Upper Alsace 155, Lower Alsace 182 per square mile.

German Lorraine

The population groups into dense areas in the manufacturing regions of the Saar and the Moselle, where industries have grown up on the coalfield and ironfield respectively. The thickly inhabited districts of Metz, Thionville, and Audun-le-Tiche overlap into France and Luxemburg at Longwy, Briey, and Esch, where the political frontiers have no relation to economic conditions as they now exist. The density of Saargemünd similarly overlaps into the industrial region of Saarbrücken, round which spreads, into Lorraine as into the Palatinate, a large area of well-peopled country. But between this area and the Moselle valley is a wide valley of sparsely populated agricultural land, through which the frontier of France and Germany runs without economic or linguistic reason. In this plateau the sparsity is owing, not so much as in French Lorraine to woods and forests, as to the competition of industries with farming, and the circumstances which have tended in modern times to deplete rural districts at the expense of urban or quasi-urban industrial centres.

German Lorraine has a total population (by the census of 1910) of 655,211, of which 323,189 inhabit towns or villages of more than 2,000 inhabitants. The average per square mile over the whole *Bezirk*, including towns, is 273; or, excluding towns, the rural population averages 140 per sq. mile.

Kreis Saarburg, rural population 121 per sq. m.—Saarburg (10,000), Walscheid (2,000), Pfalzburg (3,800), Dabo (3,000).

Kreis Saargemünd, rural population 163 per sq. m.—Saarge-

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münd (15,400), Grossblittersdorf (2,400), Neunkirchen (2,000), Bitche (4,300).

Kreis Forbach, rural population 150 per sq. m.—Forbach (10,000), Kleinrosseln (6,900), Stieringen-Wendel (4,700), Merlenbach (3,800), Mörchingen (7,000), Saaralben (4,000), St. Avold (6,400), Spittel (5,700), Freimengen (2,600), Oberhomburg (2,200).

Kreis Château-Salins, rural population 98 per sq. m.—Château-Salins (2,400), Dieuze (5,800).

Kreis Bolchen, rural population 125 per sq. m.—Bolchen (Boulay) (2,200), Busendorf (Bouzonville) (2,200), Kreuzwald (3,000).

Metz (68,600).

Kreis Metz, rural population 154 per sq. m.—Montigny (14,000), Sablon (10,700), Rombach (6,200), Stahlheim (4,200), Maizières (3,400), Borny (2,800), Longeville (2,500), Ban St. Martin (2,300), Ars (3,500)

Kreis Diedenhofen-Ost, rural population 150 per sq. m.—Thionville (14,200), Niederjeutz (Yutz-basse) (6,550), Hettange-Grande (2,900).

Kreis Diedenhofen-West, rural population 187 per sq. m.—Hayange (11,500), Grande-Moyeuvre (9,500), Algrange (9,500), Nilvange (5,800), Knutange (5,600), Clouange (3,000), Rosselange (3,000), Florange (2,600), Uckange (2,400), Fontoy (Fentsch) (3,400), Audun-le-Tiche (6,300), Ottange (3,300), Aumetz (3,100).

The districts of Germany adjacent to its northern frontier of Lorraine and Alsace, between the Moselle and the Rhine, are those of Merzig, Saarlouis, Saarbrücken, Zweibrücken, Pirmasens, Landau, and Bergzabern. In these the average rural population is 216 per square mile, as against 158·8 in the *Kreise* of Lorraine and Alsace touching the frontier, or, adding Diedenhofen-West and Metz, 162·2. The total population of these adjacent districts, including the towns of Saarlouis (15,400), Saarbrücken and its five minor towns of over 10,000 inhabitants (nearly 200,000 in all), Zweibrücken (15,200), Pirmasens (38,500), and Landau (17,800), is 667,556, as against 329,761 in the *Kreise* of Lorraine and Alsace touching the frontier, or, including Diedenhofen-West and Metz, 600,265. That is to say, the great modern industrial development shows higher results in the districts of Trier and the Bavarian Palatinate which lie outside Lorraine than in Lorraine itself, of

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which the boundary is artificial, not representing any economic or physical division. The upper and lower Saar valleys form one district industrially, and this district reaches north to Ottweiler, and east to Pirmasens. The industrial areas of Metz and Thionville, politically divided between France, Germany, and Luxemburg, similarly form one economic district closely connected with Nancy and the upper valleys of the Moselle group of rivers.

Across the Rhine, to the east of Alsace, the districts of Baden bordering on the river between Karlsruhe and Bâle show an average rural population of 184·4 per square mile, as against an average of 176·5 for the riparian *Kreise* of Alsace. The total populations of these districts in Baden, including the towns of Karlsruhe (134,300), Rastatt (15,200), Baden (22,000), Offenburg (16,800), Lahr (15,200), Freiburg (83,300), and Lörrach (14,700), is 816,226, as against 617,904 inhabitants of the Alsatian *Kreise* which border on the Rhine. Bâle, in Switzerland, has 135,000 inhabitants and the small canton surrounding the town has an average of about 420 per square mile of rural population. This centre (Bâle) connects with the south-eastern corner of Alsace (canton Hüningen); but Germany, east of the Rhine, is in no close relations with Alsace. The Rhine divides groups of population; but the Vosges do not form so definite a boundary, and the northern frontier of the Reichsland, considered in relation to population, is purely arbitrary.

Variation

The map of the variation of population shows the average annual rise or fall of the number of inhabitants per square mile. The figures for France are taken from the returns of the period 1876–1911; those for German Alsace and Lorraine include the period 1871–1910, and those for adjacent German States for shorter periods ending with 1910, representing the conditions prevailing before the war.

French Lorraine

The birth-rate,[1] calculated from the mean of the population 1901–6 and the mean annual births of the same five years,

[1] In comparing French with German birth-rate figures it must always be borne in mind that the French figures exclude stillborn children and those

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shows for the department of the Meuse an increase of 18·5 per 1,000, for Meurthe-et-Moselle 22·5, and for the Vosges 24·6. The death-rate, similarly calculated, is for the Meuse 19·4, for Meurthe-et-Moselle 19·6, and for the Vosges 20·1.

Migration, in 1906, accounted for a fall in the department of the Meuse of 9·1 per 1,000, a rise in Meurthe-et-Moselle of 4·93, and a fall in the Vosges of 1·8.

This migration is chiefly connected with the modern development of industries. German writers point to the rise in parts of the Reichsland of Alsace-Lorraine as an evidence of prosperity under German rule ; but the process has been going on in France, as indeed all over the world, during the last half-century, and its results are seen on French soil wherever there are minerals to work or water-power to employ. All along the line of the Vosges, where water-power is abundant, the French side shows a distinct increase in population. On the German side it is not only less marked, but for the greater part of the district the numbers have fallen back. The iron-workers along the Moselle from Nancy to Longwy have increased greatly, whether under French or German rule, though the development of the French ironfield is more recent than that of the German. On the other hand purely agricultural districts have been depleted on both sides of the frontier. This, in France, is owing to two main causes—the migration of farm hands to more highly paid industrial work, and the sterility of the small land-owning families whose properties are insufficient to support further subdivision. French writers maintain that the stock is healthy ; a tendency to drink is deplored ; but there appears to be no definite sign of degeneracy. Nor can it be said, now that railways and canals open up the country, that agriculture fails from a want of communications. The generation by-past has been one of transition, of the introduction of industries into a country previously rural ; the conditions of the newer life have not yet been fixed and balanced. Much of the land in the south-western part of the map is forest, and therefore not dependent upon population for its economic value.

dying before registration, while the German figures include both these classes. This consideration neutralizes a part of the difference between the notoriously low French birth-rate and the notoriously high German. Still-births in the Reichsland are 2.9 per cent. ; but the proportion of infants dying between birth and registration it is impossible to estimate with any accuracy.

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The department of the Meuse, in which industries are still of small importance, the birth-rate lower than the death-rate, and employment in neighbouring industrial districts a standing temptation to migrate, has been falling as a whole in population. The garrisons of its border towns increase the apparent total, but these numbers show little rise over a long period. Verdun, Bar-le-Duc, and Montmédy had more inhabitants in 1851 than in 1906, not counting those 'separately enumerated', i.e. in barracks, schools, prisons, &c., other than townsfolk. St. Mihiel in this period rose slightly; Commercy rose by 50 per cent., and has continued to increase; Ligny rose by 60 per cent., but has not kept up that rate of progress. And as the tendency to migrate from country to town is observed in French Lorraine as elsewhere, these figures indicate a depletion of the rural population in the neighbourhood of the towns. This is more marked in the *arrondissements* of Montmédy and Bar-le-Duc, where the depletion, from 1876 to 1906, was in actual numbers 10,452 and 6,487, or per square mile 20 and 11·6 respectively. In the *arrondissements* of Verdun and Commercy (i.e. in the Meuse valley, which shows some signs of industries) there was a small rise of 304 and 2,801, or 0·5 and 3·6 per square mile respectively. In 1876 there were 5,999 aliens in the department; in 1906, 5,262, falling from 2·04 to 1·88 per cent. of the population.

Meurthe-et-Moselle is one of only seventeen departments in all France in which population has risen steadily. Here the rise has been remarkable in districts where iron was found since the fixing of the present boundary; and there is no decline in that corner of the department which shares the mountain-valleys with the department of the Vosges and with Belfort. The town of Nancy in 1851 had 45,129 inhabitants; in 1906 the number had risen to 98,325 *plus* 12,245 'separately enumerated'; and this is only the nucleus of a group of towns, along the valley from Pont-à-Mousson to Dombasle, most of which were villages until recently, but with Nancy now make an aggregate of more than 182,000 urban inhabitants. Toul, with 8,506 in 1851, has now grown to more than 15,800, including about 4,000 'separately enumerated'. Écrouves (near Toul) is a military establishment. Lunéville, with 15,607 inhabitants in 1851, now numbers over 25,600. Baccarat has more than doubled, but at the expense of the country adjoining, which shows a continuous deficit. The *arrondissement* of Briey,

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with most of the ironfields not taken by Germany in 1871, shows a very marked increase. Its small industrial towns, represented in 1851 only by Longwy (then 3,374) and Briey (then 2,004), contain over 61,400 urban inhabitants. The population of the *arrondissement*, declining before 1876, rose in 1906 by 37,134 persons, or 82·8 to the square mile ; in 1914 it numbered 128,000, of whom 71,957 were aliens attracted by the industries, as against 18,236 in 1876.

In the department of the Vosges two *arrondissements*, at a distance from progressive industrial districts, are decreasing : Neufchâteau, with only 92 per square mile, lost in 1876–1906 19 per square mile ; Mirecourt, with 120·5 per square mile, lost 18 per square mile. There is also a loss in the plateau-lands north and south of Épinal. But Épinal and St. Dié have more than doubled their population since 1851 ; Remiremont and Gérardmer have nearly doubled ; Thaon-les-Vosges and Senones have grown into considerable towns, and many small centres in the higher valleys have increased greatly by industries during the present century. The increasing populations are those of the upper valleys of the Moselle and Meurthe and their tributaries. In 1861–81 the department declined as a whole ; from 1881 to 1886 it rose in population ; then till 1891 it fell slightly, and since then it has risen steadily. Aliens in this department increased from 3,421 in 1876 to 9,746 in 1906, or from 0·84 to 2·27 per cent.

French Alsace

The territory of Belfort is one of those parts of France which, like Meurthe-et-Moselle, have risen continuously. The town of Belfort, with 7,847 inhabitants in 1851, and 8,400 in 1861, after the siege of 1870–1 received new life from the immigration of Alsatians driven out of the Reichsland, and bringing their industries with them. In 1911 it had a population of 39,400. This great rise, making the increase of the whole territory from 1876 to 1906 in actual numbers 26,821, or 114 per square mile, is concentrated round the town, though the cantons of Delle and Giromagny have also increased. The strip of land on the frontier of Germany remains stationary. It may be noted that Belfort has a relatively high birth-rate and a lower death-rate than the departments of French Lorraine. Of aliens there were 3,296 in 1876 and 8,041 in 1906.

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Reviewing the French half of Alsace-Lorraine, we must set off its industrial activity against the comparatively inert state of its agricultural districts. It is true that in this part of France, at a distance from great towns which promote intensive cultivation, rural life seems to slumber; but wherever natural resources offer themselves the French, no less readily than other nations, exploit them. Their energy and thrift are shown by the rise of population in these more favoured areas. The agricultural department of the Meuse, numbering 284,725 in 1872, fell by 1906 to 280,220: but in that period the Meurthe-et-Moselle rose from 365,137 to 517,508, the Vosges from 392,988 to 429,812, and the territory of Belfort from 68,600 to 95,421 inhabitants.

The adjoining districts of France show a general decline in population, except in the *arrondissement* of Montbéliard. The town of Montbéliard rose slightly, with Audincourt and other small neighbouring towns, giving a general increase from 1876 to 1906 of 22 per square mile.

In the department of Haute-Saône, while there is a general fall in each *arrondissement*, some cantons suffered less. In the *arrondissement* of Lure, which fell by 10·5 per square mile, the towns of Luxeuil and Fougerolles and the canton of St. Loup rose slightly, while the cantons of Champagney and Lure remained steady. The town of Vesoul increased, but the *arrondissement* fell by 22·7 per square mile. The town of Gray remained steady, but the *arrondissement* fell by 25·3 per square mile.

In the department of Haute-Marne there was a general fall of 12·7 per square mile, the *arrondissement* of Langres suffering most (18·5 per square mile), and that of Chaumont least (7·5 per square mile), the town of Chaumont gaining slightly.

The fragments of departments of Marne and Ardennes, shown in the north-western corner of the map, also fell. *Arrondissements* of Ste. Menehould lost 11·5, Vouziers 18·1, and Sedan 16·3 per square mile.

Lorraine was therefore on the whole more prosperous than the parts of France adjacent to its boundary, and more prosperous than the adjoining parts of German Alsace-Lorraine from Metz to Masmünster.

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German Alsace-Lorraine

Before giving the variation of the smaller districts, the general statistics of the whole Reichsland may be summarized. The population of 1,281,000 in 1816 rose under French rule to 1,597,228 in 1866 (25 per cent. rise in 50 years); under the Germans it reached 1,893,000 in 1912 (18·5 per cent. rise in 46 years). In the French period its most prosperous years were 1821-26, when the average annual rise was 1·57 per cent.; the worst years were those of the Crimean War, when there was an annual decrease of 0·45 per cent. In 1866 the population was increasing at an annual rate of 0·41 per cent., but from May 1866 to December 1871 there was an average annual fall of 0·55 per cent. This must be attributed to the Franco-Prussian War, which may therefore be estimated to have cost the annexed Reichsland about 4 per cent. of its population. From 1871 to 1875 there was still an annual fall of 0·29 per cent., then a rise, 1875 to 1880, of 0·45 per cent. yearly, followed by a fall in 1880 to 1885 of 0·03 per cent. per annum. Thenceforward the population rose, but not steadily: from 1885 to 1890, by 0·49 per cent. yearly; from 1890 to 1895, 0·46 per cent. yearly; then accelerating in 1895–1900 to 0·93 per cent. per annum, and from 1900 to 1910 the rate of increase averaged 0·86 per cent. per annum. After the war of 1870–1 the average density of population was 274·5 per square mile; in 1910 it had risen to 349·6.

The rates of births and deaths (both including stillborn children) have been per 1,000:

	1841-50.	1851-60.	1861-70.	1871-80.	1881-90.	1891-1900.	1901-10.	1912.
Births	33·2	30·9	33·5	35·4	31·8	31·1	29·3	24·9
Deaths	25·5	25·6	26·9	28·0	25·1	22·5	19·5	16·0

The birth and death-rates in 1875 reached 37·3 and 30·2; in 1876 they were 37·5 and 27·6, and have since declined steadily. Of the births in 1912, boys were in excess of girls in the proportion of 106·5 per cent. Illegitimates were 7·5 and stillborn children 2·9 per cent. Of the deaths the proportion of males to females was 106·6 per cent. Suicides numbered 270 men and 52 women, or 17 per 100,000—a figure which is rather low for the German Empire as a whole. Infant mortality (or deaths under one year of age, not counting stillborn children) were 14·2 per cent. in 1910, 19·4 in 1911, and 13·1 in 1912.

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The total net gain of population under the German rule averaged 18·5 per cent. over the whole of the Reichsland, but its incidence is very irregular. The industrial and urban centres rose greatly: in Diedenhofen-West (the ironfields of Thionville) the increase was 231 per cent., and in Strasburg urban district 109 per cent. Against this there was a considerable loss in the agricultural districts (in two *Kreise*, of more than 13 per cent.). Half the area of the Reichsland suffered in this manner: the *Kreis* of Rappoltsweiler lost 1·29 inhabitants per square mile per annum, and that of Schlettstadt 1·09, as against a loss of 1·00 in the French *arrondissement* of Montmédy and of 0·96 in the French *arrondissement* of Neufchâteau (the two most depleted). From some parts of the German side the population is disappearing more rapidly than anywhere in French Lorraine.

The causes of this loss in German Alsace-Lorraine have not been merely the decline of small agricultural land-owning families, and the desire to seek a more profitable living in the richer urban and industrial parts; they are consequences of German rule. The natives who left Alsace-Lorraine from 1870 onwards were those who 'opted' for French nationality, or were expelled on account of their French sympathies, or during the generation following were unable to live under the Germans. They found homes in various countries—chiefly in France, Switzerland, and Algeria—but accurate returns of their numbers cannot be given. An estimate can be made from the deficit on the normal growth of native population; for the Germans, at their invasion, found about 1,600,000 inhabitants in the district annexed, and these at the birth and death-rates of the period ought to have grown by 1880 to over 1,722,000, whereas in that year the German census returned only 1,391,933 natives in the Reichsland. The loss of native population therefore in ten years must have been about 330,000; and as the emigration did not cease, Dr. Hans Witte (in *Deutsche Erde*, vii) is not overstating the loss by 1905 in placing it at half a million. The further total loss, including deportations, desertions, and emigrations consequent on the present war, must bring the total much higher.

From 1870–1 great numbers of Germans and others have settled in the Reichsland as military, officials, business-men, and workers in industries and commerce, exploiting the conquered country. Hermann Wendel (*Elsass-Lothringen und die*

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Sozialdemocratie, 1912) gives the number of 'Old Germans' who have come in since 1870 as 400,000. Their numbers are stated in the German census to be 155,729 in 1871; 174,737 in 1880; 238,853 in 1895; 266,577 in 1900; and 295,436 in 1910. By this last date the children of the first immigrants after 1870 would be reckoned as natives, though not Alsatians or Lorrainers. Of foreigners in 1910 were enumerated: Italians (chiefly in the Lorraine iron industries), 31,367; Swiss, 11,828; French, 11,622; subjects of Luxemburg, 11,059; Austrians and Hungarians, 6,328; British, 249; North and South Americans, 507; and subjects of other States, 3,426; making the total 76,386. The figures compared with those of 1900 show a considerable increase of Italians and Austrians, with a decrease of French; the Swiss and Luxemburgers remain at nearly the same number. The gradual increase of immigration is shown by the percentages of Germans and foreigners in the Reichsland: in December 1871, 10·05; in 1880, 11·15; in 1895, 14·55; and in 1900, 15·50. But, as every child of immigrant parentage born in Alsace-Lorraine is counted a native, these figures considerably understate the actual numbers and proportion of persons of alien blood, of whom there would be about 10,000 in 1880, and over 22,000 in 1890 (reckoning the increase of the immigrants by the difference of birth-rate and death-rate for these periods) in excess of the alien and in diminution of the true native population.

Balancing immigration against emigration, the decrease in population, 1871–80, is given as 114,000; in 1881–90 it was 68,900, and in 1891–1900, 25,700—or 7·4, 4·4, and 1·7 per thousand respectively. This means that from December 1871 to December 1880 288,737 persons emigrated, not including those who left during the war and up to December 1871; and this makes the estimate, given above, of 330,000 not improbable.

Upper Alsace

The population of 458,893 in 1871 increased to 517,865 in 1910, a rise of 13 per cent. This was chiefly owing to the progress of Mulhouse as a manufacturing centre, and in a less degree to the increase of Colmar. The whole *Kreis* of Mulhouse grew in population by 258·9 to the square mile or nearly 50 per cent. That of Colmar grew by 65·5 per square mile,

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or more than 20 per cent. All the other *Kreise* of Upper Alsace lost population: Rappoltsweiler, 50·5 per square mile or 13·3 per cent.; Thann, 24·6 per square mile or 7·8 per cent.; Altkirch, 15·5 per square mile or 6·9 per cent.; and Gebweiler 11·1 per square mile or about 4 per cent.

Within these *Kreise* certain cantons rose or fell more than others. In *Kreis* Altkirch the cantons of Dammerkirch and Hirsingen, adjoining Belfort, remained without loss; canton Altkirch lost in the rural parts and gained in the urban; while Pfirt (Ferrette) lost more heavily. In *Kreis* Mulhouse the great town rose from 52,900 in 1871 to 95,000 in 1910; canton Habsheim shared a little in the rise of Mulhouse, and canton Hüningen in that of Bâle; but the rest of the *Kreis* lost population. In *Kreis* Thann canton Masmünster gained a little; the rest lost heavily. In *Kreis* Gebweiler canton Sulz remained steady, and the decrease seen in the *Kreis* as a whole is chiefly due to canton Ensisheim. Colmar, a garrison town, nearly doubled—23,000 in 1871 to 44,000 in 1910; cantons Münster and Neu Breisach were nearly steady; the rest fell. In *Kreis* Rappoltsweiler there was a general loss, seen most in cantons Schnierlach and Rappoltsweiler.

Lower Alsace

The population, 600,406 in 1871, stood at 700,938 in 1910, a rise of 16·7 per cent. over the whole. The urban district of Strasburg rose from 85,654 in 1871 to 178,891 in 1910, or by 109 per cent.; the rural *Kreis* of Strasburg from 75,037 to 97,795, or by 30 per cent. The *Kreise* of Hagenau and Erstein also increased by 9·1 and 3·1 per cent. respectively. *Kreis* Zabern remained nearly the same as at the beginning of the period, with a slight rise of 0·04 per cent. Three *Kreise* decreased—Schlettstadt, 13·5, Molsheim, 10·5, and Weissenburg, 9·2 per cent. Or in respect of density per square mile there was a rise in Strasburg rural of 104·9, in Hagenau of 26·1, in Erstein of 10·3, and in Zabern of 0·10; and a fall in Schlettstadt of 42·7, Molsheim 27·4, and Weissenburg 24·6 per square mile.

To take the cantonal divisions of the *Kreise* in more detail, no cantons of Schlettstadt, Molsheim, or Weissenburg increased in population, though canton Schirmeck (*Kr.* Molsheim) did not decrease. No canton in *Kreis* Hagenau decreased, though

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in cantons Bischweiler and Niederbronn loss balanced gain. In *Kreis* Strasburg a great rise around the capital gave the neighbouring canton of Brumath a slight increase, but the outlying cantons of Truchtersheim and Hochfelden lost population. In *Kreis* Zabern the cantons of Maursmünster and Buchsweiler decreased, while canton Zabern and *das krumme Elsass*, 'the Crook or Elbow of Alsace', running into Lorraine as far as the Saar valley (Alsatian Lorraine), remained practically stationary in population.

German Lorraine

The population, 490,459 in 1871, was 615,790 in 1910, having risen by 25·5 per cent. The greatest contribution to this rise was in the *Kreis* of Diedenhofen (Thionville), which increased by 73 per cent.; in 1901 this *Kreis* was divided into two, and the western half, in which the greater part of the iron industries lie, increased during the whole period by 231 per cent. There was also a rise in Metz rural *Kreis* of 46, in Metz urban 33, Forbach 28, Saargemünd 15, and Saarburg 6·2 per cent.; but the agricultural *Kreise* of Château-Salins and Bolchen fell by 12 and 11 per cent. respectively. The variation per square mile, 1871–1910, shows a rise in Diedenhofen of 152·8, Metz rural 79·0, Forbach 66·8, Saargemünd 31·0, and Saarburg 9·8; and a fall in Bolchen of 18·6 and in Château-Salins of 16·8 inhabitants per square mile. Germain Lorraine gained 52 per square mile as a whole.

To localize the rise and fall in more detail, in *Kreis* Saarburg the small general improvement is owing to a higher population around the chief town. Canton Pfalzburg stood at the same figure, and the other cantons fell a little. Canton Saargemünd rose considerably; the rest of the *Kreis* was unaltered. *Kreis* Forbach owes its increase to cantons Forbach and St. Avold, which share the circumstances of Saarbrücken. Canton Grosstänchen rose a little, but canton Saaralben fell. In *Kreis* Bolchen canton Busendorf, fringing the Saar valley, alone did not suffer. Metz rural canton (part of Metz rural *Kreis*) gained, but of the rest of the *Kreis* only canton Verny did not lose. Diedenhofen west of the Moselle increased greatly except canton Cattenom, which grew a little; in Diedenhofen east of the Moselle Metzerwiese was stationary and Sierck decreased.

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Parts of Germany adjoining the Reichsland have shown, since the beginning of this century, a prosperity not shared by German Alsace-Lorraine as a whole. In the provinces of Trier and the Palatinate is an industrial area of which Saargemünd and Forbach are outlying members; it centres in Saarbrücken, which has grown rapidly. The average annual increase of population per square mile from 1905 to 1910 was in the districts of Saarbrücken 44·33, Ottweiler 16·51, and Saarlouis 14·76; in St. Ingbert 8·91, Homburg 6·73, Pirmasens 6·06, Kaiserslautern 4·03, Zweibrücken 3·98, and Kusel 1·20. Between these and the Rhine are two districts with falling population, Dürckheim (−7·98) and Rockenhausen (−0·15). On the Rhine, in the Palatinate between Worms and Alsace, there is a general rise, strongly marked at Ludwigshafen (42·32) and Speyer (8·64), but shared by Frankenthal (5·80), Bergzabern (3·06), Neustadt (2·69), Germersheim (2·17), and Landau (0·10).

In the Grand Duchy of Baden two provinces border upon Alsace, those of Karlsruhe and Freiburg, with a general rise of 3·58 and 2·86 per square mile annually in the period 1900–10. This rise occurs chiefly in the line of towns between the hills of the Black Forest and the Rhine; they have been growing while the corresponding line of Alsatian towns between the Vosges and the Rhine have been dwindling.

In Switzerland, bordering Alsace and giving the canton of Hüningen a share of its prosperity, the town of Bâle has grown in 1900–9 by 146, and the rural canton of Bâle by 1·1 per square mile per annum.

These figures, represented on the map of variation, show how German rule has stimulated population in certain limited areas, while repressing it over the greater part of the Reichsland. It favours industries directly profitable to the State, especially for military ends, such as the mines of Thionville and Saarbrücken, and the machinery of Mulhouse. It has increased the centres of government and military power at Strasburg, Metz, and Colmar. But at the same time the map bears witness in a striking manner to the want of prosperity in all other parts of German Alsace-Lorraine, whether industrial or agricultural. The industries of the eastern Vosges valleys, though still flourishing, have lost ground in comparison with those of the neighbouring western valleys which are under French rule; the population which lives on the former is dwindling, that

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which lives on the latter is increasing. The vineyard towns along the edge of the Vosges from Weissenburg to Thann are being depleted, while the similar towns of Baden, east of the Rhine, are increasing. No other explanation can be given but that of the unhappy state of the country. The variation map is the indictment of German rule in the Reichsland.

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CHAPTER VIII

LANGUAGES AND THEIR DISTRIBUTION

Distribution of Languages

The language question in Alsace-Lorraine does not merely concern French and German as spoken by the educated classes. It is complicated by native dialects far removed from either. The folk-speech of the greater part of Alsace and northern Lorraine is as unintelligible to a Prussian as the rustic talk of a Scotch village to a stranger from the south of England. On the French side of the country the patois is equally difficult to a Parisian. Education, energetically applied by the Germans in the Reichsland, is overcoming some of the difficulties ; but still the dialects persist and are valued as a sign of the individuality of which the country is tenacious. The natives are becoming able to understand German, but the official and other strangers from Germany are no nearer understanding the natives when they choose to speak their dialect and assert their separate nationality. There are therefore four main languages to be noticed : (1) French, (2) Lorraine patois, (3) German dialect, and (4) German.

(1) French, the official language of French Lorraine and the territory of Belfort, has long been also the speech of a great section of the *bourgeoisie* and upper classes of the Reichsland, partly surviving from the centuries of French rule, and partly adopted as the ' culture-language ' of an educated population which desires to insist upon the fact of its difference from Germany. Such French speakers are mainly bilingual ; the objection of the Germans to the use of French, especially in newspapers, theatres, and public meetings, was that it indicated Francophil tendencies ; it was constructive treason, and during the war it was prohibited.

The map of French-speakers in German Alsace-Lorraine shows diagrammatically the relation of French to German as it stood in 1910. All parts of the Reichsland then contained a percentage of French-speakers, though on the eastern side it was small.

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The map of Native Dialects illustrates the following paragraphs.

(2) Lorraine patois, spoken also in some parts of the Reichsland, varies with the ancient divisions of the country. As a whole it differs from normal French in pronunciation, grammar, and vocabulary. It contains many non-French words from Latin, such as *rèn'* from *rana*, *euchi* from *exire*, *fieur* from *foris*; and loan-words from Teutonic sources, such as *nodé* from *müde*, *groller* from *grollen*. The changes undergone by these Teutonic loans indicate their age: some, from the Frankish conquest before A. D. 500, are common to all French, or were common in Old French; others are peculiar to Lorraine. Later loan-words are more frequent as the German border is approached.

In French Lorraine the Barrois patois makes *-éie* of the ordinary terminal *-er*, which in the Meuse valley becomes *-aïe*. Throughout the department of the Meuse the harsh palatal aspirate (*hh*[1]) of eastern Lorraine is not used; the dialect there is softer and spoken more slowly, whereas at Metz and on the eastern side utterance is rapid. In the Briey district Frankish influence is strong; there are many Teutonic loan-words. These dialects of the old *pays* of the Barrois, Verdunois, Briey, Toulois, Bassigny, and Xaintois call for less attention here (as being in French territory) than those which are spoken in the north-east and east of Lorraine, intruding into the Reichsland and meeting German dialects along the linguistic frontier—which (it is to be noted) is a frontier of dialects, not of normal French and German. They are (*A*) the Messin, spoken round Metz to Conthil[2], (*B*) the Saulnois of the area Château-Salins–Albesdorf–Rixingen, (*C*) the Blâmont patois, spoken from Rixingen to Schirmeck, (*D*) the patois of Saales and Salm and the ancient country of the Chaumontois, (*E*) the east Vosgian, spoken in Alsace round about Schnierlach and thence towards Épinal, and (*F*) the Burgundian of Franche Comté and the Jura, spoken in the territory of Belfort and intruding in three small districts into German Alsace.

These border varieties form three small groups. The Messin (*A*) and the Saulnois (*B*) can be classed together. In both *e* before most consonants becomes *ò* to *a* (*mat'*, *mòt'* for *mettre*);

[1] Conventionally spelt *x*.

[2] Two miles south of Mörchingen (Mohrange).

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s after the *y*-sound of a French diphthong and after *r* becomes *hh* (*crahhan* for *croissons*, *gèhhon* for *garçon*); in *pl*, *bl*, *fl*, *gl* the *l* becomes *y* (*gyès* for *glace*). The differences between Messin and Saulnois appear in vowels and diphthongs: Messin makes diphthongs of open *e* and *o* and closed *e* (*pyer'* for *pierre*, *byœ* for *bœuf*) while Saulnois sounds these vowels as monophthongs (*pir'*, *bü'*), and after a labial followed by the *w*-sound uses a closed *e* (*pwer'* for *poire*).

Blâmont patois (*C*), Chaumontois (*D*), and east Vosgian (*E*) are grouped together as Vosgian. Their differences are chiefly in the treatment of vowels: (*C*) uses diphthongs like the Messin in *pyer'*, *bye*, *pwor* for *poire*; (*D*) makes monophthongs of certain words only, as *pyer'*, but *vi* for *vieux*; *syœ* for *sœur*, but *bü* for *bœuf*; *mwo*, for *mois*, but *pour* for *poire*; (*E*) uses monophthongs throughout, as *pir'*, *ü* for *œuf*, *puhh* for *poix*.

The Burgundian patois (*F*) resembles east Vosgian (*E*) in using monophthongs (*pir'*, *bü*) but shows the *w*-sound (*mwa* for *mois*), used in the Saulnois (*B*) after labials, even when the preceding consonant is not a labial.

All these varieties have only one case in substantives, and the inflexion of verbs is very simple. Genders are as in Latin or Old French; adjectives sometimes form the feminine in *-t* (as *crüt* for *crue*). In pronouns *que* is both subjective and objective, and in the phrase *ce-là* the *ce* becomes an article with *là* following the noun. These differences (and others) show a definite set of local dialects developed from the Latin *lingua rustica*—in Lorraine under the influence of Frankish, and in the Vosges influenced by Alamannic.

(3) The German dialects have been studied by native and German scholars and have been described by them in detail. They group broadly into two divisions—the Alemannic of Alsace, using the high German *Pf*, and the Frankish of Lorraine, using the low German *P*. There are four main varieties of Alsatian, and two of Lorraine German.

(*a*) In county Ferrette, south-east of a line from Pfetterhausen to Klein-Landau, the language is practically the Swiss (High Alamannic) of Bâle. (*b*) Upper Alsace, south of Schlettstadt, speaks a Middle Alamannic. (*c*) Lower Alsace, from Schlettstadt to Hagenau, speaks Low Alamannic. (*d*) North of the Hagenau forest the South Frankish of the middle Rhine is spoken.

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The German dialects of Lorraine are spoken north-west of a line from Weissenburg, along the eastern edge of the Vosges to Zabern and thence west to Harzweiler. Between this line and Mörchingen the Saar valley variety (*e*) is the Rhine Frankish of the Palatinate. North-west of Mörchingen to the boundary of Luxemburg the Moselle valley variety (*f*) is the Middle Frankish of the Ardennes. In the area Albesdorf–Püttlingen–Forbach–St. Avold–Falkenburg the two varieties overlap.

Beside these dialect-areas there are very small intrusions of German dialect into French Lorraine created by colonies of Mennonites—a sect of Anabaptists founded 1523 at Zürich, and afterwards following the teaching of Menno Simonis (1492–1559). They took refuge in the Vosges and as conscientious objectors are exempted from military service since 1795. They have eleven communities (near Montbéliard, Nancy, Épinal, and Chaumont), all speaking German and numbering about 1,110 members in 1901.

In Alsatian German generally, many French words are used (*Tumbro* for *tombereau*, 'wheelbarrow'; *Schandel* for *chandelle*), and a German termination turns *choisir* to *schwasieren*, *blesser* to *blessieren*, &c. The syntax is often French, as *i geh der letst* from *je marche le dernier*; *s'isch ne* (= *ihn*) from *c'est lui*.

Some distinguishing peculiarities in the dialects of Alsace (*b*) and (*c*)—(Mulhouse to Hagenau—may be noticed. The changes from Old German are:

Old Germ.	ā	becomes	ō or ū;	ă	becomes	o (*Orm* for *Arm*)
,,	ē	,,	ē;	ĕ	,,	a (*asse* for *essen*)
,,	ī	,,	ī or ɪ;	ɪ	,,	e (*Melich* for *Milch*)
,,	ō	,,	ō;	ŏ	,,	ŏ
,,	ū	,, long	ü;	ŭ	,,	ŏ
,, long	ü	,,	i; short ü		,,	i
,,	œ	,,	ē; short ö		,,	e

The diphthongs are pronounced as two separate vowels (*tiaf* for *tief*) but

old *uo* becomes üä, üe, üu (in Münsterthal *Füäs*, in Zornthal *Fües*, at Weier-im-Thal *Füus*, for *Fuss*);

old *ei* remains *ei* in Upper Alsace, but becomes *œ* in Lower Alsace before a liquid (*klœn* for *klein*);

old *ou* becomes *aü* or *oi* in Upper Alsace (*Froi* for *Frau*) but in Lower Alsace *au*;

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old *öu* becomes *ai* in Upper Alsace, but in Lower Alsace before a liquid is *æ* (*Bæm* for *Baüme*).

The terminal *e* is dropped (*Stub* for *Stube*); the terminal *en* becomes *e* (*asse* for *essen*). *Ge-* and *be-* are shortened before *s*, *sch*, *h*, and *z* (*gfalle* for *gefallen*), but a short vowel is inserted between *l* or *r* and other consonants (*Melich*, *Strossburig*). *N* is used to fill a hiatus (*wo-n-i* for *wo ich*, and in Lower Alsace *niks ze-n-asse* for *nichts zu essen*).

In treatment of consonants: terminal *-ng* and *-ch*, and *l* before *t*, are dropped (*Hari* for *Häring*, *wott* for *wollte*, *au* for *auch*). *S* falls out (*mien* for *müssen*). *B* becomes *w* (*blīwe* for *bleiben*) or drops out (*genn* for *geben*). In lower Alsace *g* after a vowel or *l* and *r* becomes *y*; in Upper Alsace *ag* becomes *āy* (*saje* for *sagen*), but in Lower Alsace it is *āw* (*sāwe*).

The declension of verbs is simplified by dropping the conj. pres., and making the ind. pret. with a participle. The conj. pret. is made with *-t* or *tet* (for *thät*). The second pers. sing. is in *-sch*; the second pers. pl. in *-e*.

The declension of nouns is made with prepositions—the genitive with *von*, the dative with *im* (*i sās im Vater* 'I say to father).' The genitive is sometimes expressed by the dative (*im Vater sin Huet*, 'father's hat'). The plural *Umlaut* follows the dialect vowels (*der Orm*, *d'Arm*, for *Arm*, *Aerme*) and in masc. and neut. plural the *-er* is dropped (*d'King* for *die Kinder*).

Genders are often peculiar. Diminutives are very common; children's names are usually diminutive and neuter, and a peasant calls his wife—unless she is old—'*es*' ('it'). Even verbs and pronouns have the diminutive ending applied to them as *wasele?* ('what-little?'). Alsatian dialect is characterized by irony and picturesqueness; there is a great variety of phrases for outwitting, scolding, beating, eating, drinking, drunkenness and so forth, in which it resembles Northern English.

Within the main divisions of Alsatian dialect there are subdivisions: at Strasburg no less than three varieties have been discriminated—among the people of the boatmen's quarter, the inner town, and the suburbs. Language-islands also are found; e.g. *King* (for *Kind*, as in the upper Sundgau) is said on the Kochersberg (west of Strasburg), and between Buchsweiler and Pfaffenhofen, and again eastward on the Rhine. These details are explained by the history of the country, which was broken up into small fragments connected with others at a distance.

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The dialects of German Lorraine (with the Frankish *P* as opposed to the Alamannic *Pf* of Alsace) divided into the Rhine-Frankish of the Saar valley and Dabo, and the Middle Frankish of the Moselle valley, have peculiarities and idioms distinguishing them from the Alsatian, and from each other. West of Falkenberg–St. Avold–Spittel *dat* and *wat* are used for *das* and *was*; *up* and *op* for *auf*; the old *ch* is lost before *s*, *r*, and *t* (*gebrat* for *gebracht*); *ch* and *g* are lost at the ends of words, and *g* between two vowels. Near Diedenhofen (Thionville) *w* is dropped after *sch* (*Seschter* for *Schwester*); *œ* is used for *ei*, and *oi* for *ou*; the old *ie* and *üe* become *ei* and *ie*; the old *uo* is retained. In substantives the accusative is the same as the nominative; feminines are made with *-esch*, instead of German *-in*). In verbs *n* is added to the 1st pers. sing. pres. ind. (*ech glewen* for *ich glaube*); many strong forms are used, and the indic. pret. is made with *hann* or *sin*. Of 2,500 words peculiar to Alsace the Thionville district knows only 250.

The number of native dialect-speakers is not given in the German census. In 1900 the population of the Reichsland was 1,719,470, of whom 1,492,347 spoke German only, including local dialects. From these must be subtracted immigrants speaking German only. There were 65,251 'old Germans' (immigrants from the rest of the German Empire), 2,876 Austrian subjects (not including Hungarian subjects or speakers of Moravian and Czech, but including a proportion of the 1,410 speakers of Polish only), and 11,934 Swiss (of whom many would be bilingual). Both German and French were spoken by 7,110, including the more educated Alsace-Lorrainers; so that the number of bilingual immigrants could not greatly reduce the total of immigrants speaking German only, which may be placed at about 77,000, leaving about 1,424,000 native speakers of native German dialects.

'French' only was spoken by 198,318; but again no discrimination was made between speakers of normal French and those using native patois. Subtracting the 14,934 French subjects then in the Reichsland and Alsace-Lorrainers brought up to speak normal French, we get about 180,000 as the number of native speakers of Romance dialects in German territory in 1900. In 1905 there were 200,220 French-speakers altogether, but it is stated that there were then only three communes in which no German was spoken—Solbach in Canton

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Schirmeck, Bacourt in Canton Delme, and Juvelize (Geistkirch) in Canton Vic.

(4) German, by the Constitution of 1911, the official language of the Reichsland, is practically the language of the immigrants, not the mother-tongue of the people. But the authorities have been energetically introducing German into the Romance-patois area, and their progress is seen in the diminution of the number of communal councils permitted to use French. In 1872 four cantons of Lower Alsace (Molsheim, Saales, Schirmeck and Weiler) included 28 places where the councils transacted business in French; by 1897 these were reduced to 22. In the same period four cantons of Upper Alsace (Dammerkirch, Ferrette, Markirch, and Schnierlach) reduced their French-speaking councils from 24 to 3. In German Lorraine, of 759 councils in all, 378 French-speaking *Gemeinden* were reduced to 287. In 1903, of these 287, 122 still used French, 102 were bilingual, and the rest used German. This intrusion of German into the areas marked on the dialect-map as those of Romance patois does not mean that French-speakers became German-speakers, but that the local administration was often carried on by business-men and officials from Germany, who were naturally chosen as members of councils. The increase in the percentage of German-speakers was also greatly affected by the large garrisons of German troops quartered throughout the country. At Metz in 1905 there were 13,035 military and 18,594 civilian Germans against 12,829 French-speakers. In Metz rural district there were 44,566 Germans, 15,265 French-speakers, and 4,105 others.

In many cantons the increase in German was owing to the dwindling of the French-patois population. From 1900 to 1905 the ratio of French to German in Delme dropped from 94·06 to 92·61; in Vic, from 89·59 to 88·44; in Château-Salins, from 87·69 to 86·32. In Canton Verny, where the French population did not decrease, the French language sank from 83·67 to 80·33. In others a falling population left the French-speaking percentage greater, as at La Poutroye (92·92 to 93·35), Markirch (43·29 to 44·28), Rixingen (81·74 to 82·24), Lorquin (76·68 to 77·10), and Gorze (69·73 to 70·77). In some cantons French gained ground, as in Busendorf (1·90 to 2·15) and Hirsingen (1·97 to 2·69). In 1905 at Strasburg 3,654 persons, at Colmar 1,229, and at Mulhouse 3,099 were French-speakers

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by mother-tongue but not by nationality, representing the nationalist or anti-German tendency of the more educated Alsatians.

Thus, while the Germans were germanizing their annexations in Lorraine, counter-action was going on in Alsace ; and in 1907 attention was called (see Chap. XI., p. 229) to the nationalist or Francophil movement, of which one manifestation was the considerable increase in the use of French, and the demand for French in schools. The movement nevertheless continued.

The census of 1910 (quoted by Baumgarten, *Deutsche Erde*, 1912) shows the following figures for ' French ' and ' German ' (including dialects) spoken as mother-tongues in the districts (*Kreise*).

	German.	*Bilingual.*	*French.*	*French as compared with 1900.*
Strasburg (urban) . .	172,027	825	4,872	+ 1·1
Strasburg (rural) . .	97,233	34	426	+ 0·4
Erstein . . .	64,662	66	388	+ 2·8
Hagenau . . .	79,539	11	430	— 0·9
Molsheim . . .	50,913	36	15,965	+ 3·0
Schlettstadt . .	63,691	63	3,698	+ 0·2
Weissenburg . .	56,413	16	113	— 1·2
Zabern . . .	86,947	26	502	+ 1·1
Lower Alsace .	671,425	1,077	26,394	— 0·4
Altkirch . . .	49,067	40	2,438	— 2·4
Colmar . . .	94,231	417	2,628	+ 1·3
Gebweiler . . .	60,601	78	693	+ 3·7
Mulhouse . . .	181,155	492	5,454	+ 7·5
Rappoltsweiler . .	38,596	119	19,184	+ 13·8
Thann . . .	57,725	125	1,374	+ 6·9
Upper Alsace .	481,375	1,271	31,771	+ 2·6
Metz (urban) . .	53,537	304	13,757	— 42·4
Metz (rural) . . .	56,320	246	52,292	— 141·4
Bolchen . . .	36,411	65	5,158	— 17·3
Château-Salins . .	14,096	48	30,994	— 13·8
Diedenhofen-Ost . .	55,221	43	5,216	— 40·3
Diedenhofen-West .	51,609	243	21 007	
Forbach . . .	89,441	42	2,638	— 12·9
Saarburg . . .	51,750	45	14,141	— 17·9
Saargemünd . .	73,075	11	894	— 3·1
German Lorraine .	481,460	1,047	146,097	— 44·8
Alsace-Lorraine .	1,634,260	3,395	204,262	— 9·3

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A comparison of these figures of 1910 with those of 1905 shows a decline of bilinguals and of 'French'-speakers in German Lorraine, but an increase in Alsace, especially in the towns. This increase was not due to a greater number of French subjects, for they had fallen to 11,622, nor to naturalized French, for they had dropped from 22,618 in 1905 to 21,520 in 1910. Foreign subjects in all had dropped from 79,431 to 76,386, and those born abroad from 78,395 to 75,855. Italian immigrants in 1910 were 27,434, or 15·3 per thousand of the total civilians as against 17·1 per thousand in 1905. On the other hand, German immigrants, from other parts of the empire, had risen from 274,546 to 295,436. Nor again did the displaced French-speakers of Lorraine move into Alsace, for in 1910 only 2·7 per cent. of Lorraine natives were living in Alsace. The increase in French-speaking was evidently due to the nationalist movement, which promoted the use of French as a protest against German rule.

A discussion in the Landtag of June 16, 1917, is reported to have brought out the statement that in the Reichsland there were then 87 per cent. of 'German-' speakers, 12 per cent. of 'French'-speakers, and 1 per cent. speaking other languages.

During the war the French language was totally prohibited in the Reichsland. Even French place-names and street-names are said to have been everywhere superseded by German ones, invented for the purpose by ingenious officials. A few examples may be given as a curiosity: Jouy-aux-Arches becomes Gaudach; Mézières, Machen; Dieuze, Buss; Moyenvic, Moderich; and so forth.

History of the Dialect Frontier

On the map of Native Dialects the political boundary is marked with a black line; the blue and red line to east of it shows the linguistic boundary between the Romance and the Germanic as it existed in the ninth and tenth centuries; and the area coloured red is that in which, at the beginning of the present century, the German dialects already described were spoken.

The Alsatian German dialect is the result of Alamannic settlements begun in the fourth century A. D.; the Lorraine German dialect is inherited from the Franks who settled in the north of Lorraine in the fifth century and conquered the

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rest of Lorraine without exterminating the language of the romanized Gauls, from whose *lingua rustica* the Romance patois is derived.

The first continuous examples of both languages occur in the Oath of Strasburg (842), sworn by Louis the German in 'Romance'—'Pro Deo amur et pro Christian poblo et nostro commun salvament,' &c.—and by Charles of France in 'Theotisc' (i. e. the 'popular tongue' of the Germans, whence *Deutsch*)—'In Godes minna ind in thes Christianes folches ind unser bedhero gealtnissi,' &c. The boundary between these tongues then passed Fontoy, Moyeuvre, Bronvaux, Ay, Vigy, Landonvillers, the forest of Rémilly, and Avricourt (leaving those places on the Romance side) to the Donon: thence west of Schirmeck and Weiler, including on the Romance side Leberau (Lièpvre), Urbach (Fréland), and Orbey (Urbeis); following the watershed southward and finally taking in, on the Romance side, the three small districts of St. Cosman, Gottesthal, and Ottendorf.

Metz was always French—on the Romance side of the line—though it always had some German elements. In the twelfth century, of 115 magistrates only three had German names. There still remain fragments of translations from the Bible into the Metz dialect of the late twelfth century, and the *Geste des Loherains* of that age. Of the thirteenth century there are patois translations of St. Bernard's sermons and bishop Haimon's commentaries, part of a romance of *Merlin* and *L'image du monde* by Gauthier of Metz. To the fourteenth century belong a translation of the Psalms, and *La guerre de Metz en 1324*. In the fifteenth century a Lorraine writer turned into his native dialect the French work *Le saint voyage de Jérusalem*. At the Reformation Luther's German works were not read in Lorraine, but the French-Genevese teaching of Calvin found many converts. In the seventeenth century the production of dialect-writings was more self-conscious, for by that time the French 'of Paris' had come into contact with the Romance of Lorraine; but dialect was written. The chief works were: *Grausse Enwarage*, 1615; *Dialogue facétieux d'un Gentilhomme français*, 1671; *Flippe Mitonno ou la famille ridicule*, 1709–20; *Chan Heurlin ou les bruilles de Fanchon*, a poem by Brondeik, 1785–7; the comedy *Les revenants*, 1823; *Les bucoliques messines*, 1829. In the nineteenth century many old

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folk-songs were collected and modern examples added, especially by the well-known dialect-writer, Pastor Vion of Bazancourt, who died in 1896.

Strasburg on the other hand was anciently German in speech and literature, with all the plain of the Rhine. The monk Otfrid of Weissenburg wrote his poetical version of the Gospels in Frankish. An Alsatian, Heinrich der Glichzare, turned *Reineke Fuchs* into German rhyme from the French. Reinmar of Hagenau was a pupil of the minnesinger Walther von der Vogelweide. Gottfried of Strasburg represents the flower of Middle High German litterature. Johannes Tauler the mystic preached at Strasburg, and there Sebastian Brant produced his *Ship of Fools* (1494). Jorg Wickram of Colmar is considered the father of German prose romance, and the Colmar meistersingers of the fifteenth century were famous. The Reformation introduced Luther's German Bible and other works. It was only after the French occupation of Alsatian towns (1634) and of Strasburg (1681) that French began to be the 'culture-language' east of the Vosges; but the German dialect was still not only spoken but written, and its literature is as considerable and interesting as that of Northern English and Scottish.

The linguistic frontier of the ninth century was slightly shifted between the early thirteenth century and the middle of the sixteenth. There was a forward movement of German north-east and south-east of Metz, and at Brückensweiler and Pfetterhausen in southern Alsace. But the rest of the line stood nearly constant during this period. Of this there is proof in mediaeval documents. For example, Eckerich (near Markirch) was so named in 1051, but it was Belmont in the ninth century; the present Altweier (French Aubure) was 'in Alburis' in the thirteenth century; Schnierlach in 1340 was 'la Poutraye'; Urbach (French Fréland) was in 1421 'Frallan'. The registers of county Rappoltstein show that in 1442 French names were in great majority at Urbeis (Orbey), but in hamlets near it, afterwards French, there was a preponderance of German names. This was not the result of French immigration along the route across the Vosges, because the names were mainly French in the secluded lateral valley of Urbach (Fréland) in 1421. Schnierlach (la Poutroye) contained a few Germans, but their names give their place of origin ('of Strasburg', 'of

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Keysersberg', &c.), showing that they, and not the French, were the immigrants. Markirch (Ste. Marie-aux-Mines), though now preponderantly German, contains a minority of original French or patois-speakers; the part of the town on the left bank of the river is still called the French town.

The conclusions drawn from detailed study of these French or Romance-speaking areas, east of the ridge of the Vosges, make it plain that their inhabitants were descendants of Gallo-Romans, pushed up into the hills by Alamannic pressure from the east. But north-west of Schirmeck, along the frontier to Thionville, where there was little in the way of a natural boundary, but continual readjustment of political limits, the line was shifted considerably after the beginning of the seventeenth century—the period of the Thirty Years' War.

In that war frequent invasion almost depopulated the area lying between the ancient and modern linguistic boundaries, from Mörchingen to Türkstein. After the war it came under France, and was recolonized, partly by French immigrants from Picardy. Saarburg became head-quarters of French rule, and centre of a district of French—not Lorraine-patois—speakers. French influence was felt also in Schirmeck and the upper Breuschthal. But on the other hand mining, practised by Germans only, introduced German into the valley of Markirch. Thus the frontier of the ninth century was modified by a general advance from the French side except at Markirch.

In Lorraine at later periods French advanced a little farther as the result of occasional efforts to gallicize the patois and dialect-speakers, whose ignorance of any but their local language isolated them from general intercourse and was believed to be a cause of their poverty. In a few places (as at Marsal) French was made the official language even in the sixteenth century, but it was not until 1748 that this change was ordered for the whole of Lorraine, nor until 1794 for Alsace also. At this last date the Republican Government attempted to set up free schools, teaching French, in every parish or canton of Lower Alsace; but in 1800 the *préfet* reported that the people resisted compulsory French, and little more was done to gallicize the German-dialect speakers for half a century.

In 1852 the *préfet* of the Meurthe department reported that in Dabo (Dagsburg) few knew French; similar reports were made from Sarrebourg (Saarburg), Saarguemines (Saargemünd),

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and Thionville (Diedenhofen). The peasants, strongly attached to French government, were still more strongly averse to the French language. In this they were guided by their priests and pastors, who felt—Catholics and Protestants alike—that French literature was immoral. It was the age when Paul de Kock was popular.

Nevertheless in 1858 the educational authorities obtained the consent of the bishops of Metz and Nancy to a scheme of instruction in French only, for children of six to eight, followed by bilingual teaching, with religious lessons in German and arithmetic in French. In 1861 this scheme was replaced by explanatory instruction in German in the early stages, leading up to the sole use of French. Later some attempt was made to insist on the children's talking French out of school. From 1862 to 1867 the number of French-speaking children rose from 14 per cent. to 64 per cent. But this short-lived effort to introduce bilingualism to the mass of the people hardly affected the linguistic frontier, nor did it affect the speaking of French already established among the more educated classes. And in 1867 the Emperor Napoleon III on a visit to Strasburg advised teachers not to neglect German ; upon which the local educational authorities in Alsace decided to give German an equal place with French in the schools—so slight was the pressure brought to bear upon the Germanic population by France.

Two years later came the German invasion, and the process was reversed. What the French Government had done tentatively was done with vigour by the Germans ; but native independence, which opposed compulsory French, now opposed compulsory German. The course of the struggle is described in Chapter XI, pp. 218–235.

In 1908 a German writer (Prof. Dr. E. Martin, *Deutsche Erde*, vii) summed up the situation thus : the gallicizing movement had been progressing steadily since 1870 ; businessmen required both languages ; elementary teachers expected to be taught French in their training-schools ; thousands of girls went into service in France to learn French ; many newspapers were exclusively French in language and in sentiment ; women of the educated class preferred French and taught it at home to their children : but on the other hand a ' young Alsatian ' school of verse (in German) had arisen, and

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dialect poetry was cultivated. To which another (H. Witte, *Deutsche Erde*, viii, 1909) replied that the cultivation of dialect was not a step towards closer connexion with the empire, but an assertion of nationalism; and, though some Alsatians had become famous as writers of German, more immigration was needed to convert the Reichsland from its aloofness into true union with Germany.

During the war Alsace-Lorraine was flooded with Germans and depleted of patriotic natives. But dialects are not easily eradicated; nor does the use of a Teutonic dialect by a majority of the population imply adherence to the cause of the German Empire in Alsace-Lorraine any more than in Switzerland or Holland or England.

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CHAPTER IX

HISTORY: TO THE ELEVENTH CENTURY

INTRODUCTION

THE position of Alsace-Lorraine in relation to the Great Powers of Europe has been the subject of two main theories—the French theory of the seventeenth century and the German of the nineteenth.

The French theory naturally followed the teaching of the Renaissance and the study of Roman history; from which it appeared to all educated people of the time that France was Gaul, and the Rhine its natural boundary. This was the ideal of Richelieu, who wrote in his *Testament politique*—'J'ai voulu . . . identifier la Gaule avec la France.' The aim was realized by Louis XIV, and thus Alsace-Lorraine remained French until 1870.

In the meanwhile the Gothic revival and the study of mediaeval history created a new conception, equally based on the facts of the past—that of the Holy Roman Empire as the parent of German nationality and of the modern German Empire. According to this theory Alsace-Lorraine was a western borderland of Germany; its small States had owed allegiance in the Middle Ages to the ancient Empire, which, dissolved in 1806, was revived in 1871; its Gaulish population had been replaced by Germans; the claims of so distant a past had lost their force. Both banks of the Rhine, up to the Vosges and the Moselle, had been part of the Holy Roman Empire and were needed in order to make the new German Empire its successor.

This theory, more or less recognized, underlay the sentiment of German poets and popular writers in the early part of the nineteenth century;[1] it was adopted by Mommsen and German

[1] As held about 1870, this theory sometimes implied that the Alsatians were conscious of their Teutonism and groaned under an alien French yoke; but it need not, and did not always, imply anything of the sort. The clearer-sighted Germans knew well that the Alsatians detested Germany, and this even before the protests of 1871. See Note B to Chapter XI.

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historians, and carried into effect by Wilhelm I and Bismarck. It afforded the justification of the war of 1870, in which the victory was used to capture the ironfields of Lorraine and the industries of Alsace for German commerce.

This practical motive still remains. The real question of the present day is the possession of these sources of wealth. Of the 'self-determination' of Alsatians and Lorrainers there is no doubt; their history since 1870 has been that of continued protest against the annexation, and their sentiment is grounded on their earlier history.

A section of German writers—notably the modern Socialists—refuse this appeal to history; they rest their case upon the developments of the last few years and the conditions of the present. But even the most recent circumstances have their roots in the past and cannot be understood otherwise; the character of a population, its adaptability to new environments, is given by its inheritance. As therefore the general political relations of the Great Powers have been described in the *Manual of Belgium* (I.D. 1168), these chapters are devoted to the internal history, the making of the people of Alsace and Lorraine.

The Roman Empire

In the year 72 B. C. the struggle between Gauls and Teutons for the possession of Alsace and Lorraine had already begun. For some time past, that part of Gaul had been inhabited by the Celtic tribes of Sequani, Leuci, and Mediomatrici. Their neighbours, the Aedui, who had been accepted to friendship by the Romans, were at variance with the Sequani of Upper Alsace and northern Burgundy. The Sequani invited to their aid a Teutonic chief, Ariovistus, at that moment leading a migratory horde from the east in search of new settlements. He came across the Rhine with 15,000 followers, and having gained a footing in Gaul not only kept it against the Celts, but obtained, in 59 B. C., the countenance of Rome in support of his position. In 58 B.C. no less than 120,000 Germans had entered the country. They had advanced as far as Vesontio (Besançon), appropriated one-third of the lands of the Sequani, and were demanding another third, because the tribe of the Harudes, numbering 24,000 persons, had lately crossed the Rhine to join them. Another tribe, the Suebi, were preparing

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to follow. The Teuton conquest of Gaul—and perhaps of Italy—was imminent.

Julius Caesar had recently driven the invading Helvetii to their former homes across the Jura. He was asked by the Aedui to repel the Teutons. He occupied Vesontio and in September 58 B. C. fought a decisive battle with Ariovistus (recent opinion places the scene in Upper Alsace, near Gemar) and drove him back over the Rhine.

In 53 B.C. the Treveri were still unsubdued. They invited help from Teuton tribes (especially the Suebi) and with other northern Gauls defied Caesar. Their allies were crushed in Belgium, and they themselves were overcome by Caesar's lieutenant, Labienus, and submitted to Rome. They took part in the rebellion of 52 B. C., when Caesar enlisted Germans on the Roman side ; but the overthrow of the Gauls at Alesia in the country of the Aedui completed the conquest.

The earlier emperors organized Gaul as part of the Empire. Tiberius divided the country between the Meuse and the Rhine into two military districts as a frontier territory, the division starting from the Rhine at a point south of Bonn. In A. D. 21 there arose a rebellion in which the Treveri, Aedui, and Sequani joined ; but the legions guarding the Rhine were able to suppress the Gauls as well as to ward off the Germans. *Legio II Augusta* was stationed at Argentoratum (Strasburg) ; by A. D. 43 the district was pacified, the legion was sent to Britain, and the camp stood empty until the year 70.

In that year there was a more serious rising, in which the Treveri and Lingones joined, hoping to establish an independent Gaulish empire, which indeed was proclaimed at Trèves, the chief place of the Treveri. But the Gauls were disunited ; their general council at Lugdunum (Lyons) determined against the attempt. The northern tribes were further broken up by some settlements of Teutonic immigrants on their borders. The romanization of Gaul had already made some progress ; and the ideal of self-government was doomed to failure.

After the restoration of peace the Romans, under Vespasian, carried on a successful campaign (A. D. 73–4)—unrecorded in history but traceable by monuments—against the Germans, completing the conquest of the district east of Strasburg, which they included in the area defined by the German *limes*.

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About A. D. 90 this added territory, with the military frontier departments of Tiberius, were organized into the provinces of Upper and Lower Germany. The former included all Alsace, while Lorraine was assigned to Gallia Belgica. Trèves (Augusta Treverorum) became a municipality before the end of the first century; and when the provinces were redistributed under Diocletian it was the capital of Gaul. The Sequani, including southern Alsace, received the rights of Italian citizens before A. D. 100, and in that year the *Legio VIII Augusta* was stationed at Strasburg, which remained its head-quarters for two centuries.

The organization of Roman Gaul was not, however, based on town-life, of which there was little, but on the canton, or area, inhabited by the tribe. The native aristocracy was powerful. The population was ruled through its own chiefs; local autonomy was not only permitted but encouraged. The Celtic language was still spoken, though the first three emperors had tried to suppress it; and it is probable that the inhabitants of the wilder districts spoke Celtic down to the fourth century, when Latin had become the language of the growing towns and the upper classes. Mommsen indeed remarks that Christianity, preaching the gospel in Latin, rather than Roman rule and classical education, put an end to the native language. But shortly before this there was a remarkable revival of Celtic traditions. During the third century, for example, the native *leuga* (league of 1½ Roman mile) was substituted for the Roman mile on wayside stones; native deities were again worshipped, and a reaction against foreign culture set in, which, but for the advent of Christianity, might have gone far to dissociate Gaul from the Roman world.

Eastern Gaul—our district included—was highly prosperous and wealthy under the Empire. Agriculture flourished, especially the breeding of cattle, sheep, and pigs. Remains of many fine country-houses prove domestic comfort and well-being, though the vine was not grown until the time when Probus (276–82) permitted viticulture to provincials. As illustrations of country life in the north of our area may be mentioned two monuments, one from Arlon near Luxemburg and the other from Neumagen near Trèves: the first showing a market-cart and woman with the fruit-basket on one side and the sale of apples on the other; the second in the form

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of a boat with its crew and a cargo of wine-casks. Latin literature was cultivated ; teachers at the various centres are mentioned, and we owe the first description of the Moselle to Ausonius, a professor of the school of Burdigala, who visited Lorraine in the later part of the fourth century. The name of the Vosges is found in a Roman inscription at Bergzabern, 'Vosego Maxsiiminus v. s. l. m.'. Its pronunciation is fixed by the line of Lucan (*Pharsalia*, i. 397), 'Quae Vŏsĕgi curvam,' &c.

This wealth and prosperity of Alsace and Lorraine was naturally a standing temptation to the inhabitants of wild Germany. While the Empire was strong, they were not allowed to settle within a certain distance of the Rhine ; under Nero, for example, the Frisii were evicted from land they had occupied within the prohibited area. But early in the third century a new movement began with the westward pressure of the Alamanni. In 213 A. D. they were defeated by the Romans under Caracalla ; in 235 they were bought off, at Strasburg, by the Emperor Alexander ; in 236 they were driven back by Maximinus. But after this date Rome lost the eastern district (the Black Forest, &c., between the *limes* and the Rhine), in which no inscriptions have been found of later period than 250. In 253 the Franks first appear, under that name, as attempting similar encroachments on the lower Rhine ; they were kept back by Gallienus, but the right bank of the Rhine as a whole was lost to Rome.

The Frankish Settlement

The Teutonic pressure continued. Tetricus withstood it for a time, but after his death in 275 the enemy crossed the Rhine and devastated the country. Shortly afterwards Probus drove them out and settled part of their land, building towns and forts among them. But the Alamanni still waited, on the right bank of the Rhine, for the opportunity of entering their 'promised land', and in 296 their settlements extended from Strasburg and Bâle to a limit east of Ulm in Bavaria.

In 353 they took Argentoratum (Strasburg), from which they were driven in 357 by the Emperor Julian 'the Apostate'. In 365 they returned and began in 377 to settle in the plain of Alsace, driving the romanized Gauls to the hills. To this period are assigned the remains of stone-built ramparts and dwellings, with graves, between Saverne (Zabern) and Lorquin

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(Lörchingen) of a type not elsewhere seen in Alsace-Lorraine : it is supposed that they were finally ruined by the Huns who passed through this part of the country about 450. The Huns no doubt devastated the settlements of the Alamanni, but these continued to inhabit the Rhine plain, founding the almost innumerable villages with names ending in *-heim*. The Gauls were driven to the valleys of the Vosges (see the Chapter on 'Language'), which the Alamanni at first did not penetrate.

Meanwhile the Franks had been occupying the country west and north of the Vosges. Their name, given as *Frangones* by Cicero, probably meant the 'free' (*frank*) tribes of Teutonic race on the Rhine in the time of Caesar. In the third century A. D. they began to migrate, part going eastwards and forming the Chatti (Hessian Franks) and a more vigorous body travelling westwards to Flanders and forming the tribes of Salian Franks in Salland—the district east of the lower Yssel and south of Friesland. Salian Frankish pirates infested the coasts of Gaul and Spain in the third century, forerunners of the Vikings. Their settlements in Flanders and northern France are known by the ending *-hem*, *-ain*, *-in* (= *heim*); and by the middle of the fifth century they were called the Western Franks, the name of Salian or Salic remaining only in connexion with their laws as drawn up under Clovis, of which the provision for a male inheritance of the kingship is well known in history.

On the old Frankish lands upon the Rhine below Andernach (the last Roman station in the early fifth century) a remnant of the same race survived at the migrations of the third century to become the Ripuarian Franks, *Rip-waras* or dwellers on the *ripa*, the bank of the Rhine. In 412 they had spread southwards and attacked Trier, till then an important Romano-Gaulish city : in 418 they took the town and held it thenceforward. The settlement of the Moselle valley was formed (according to the inferences of Bremer) by a mixture of Ripuarian and Hessian Franks, the former predominant, and their boundaries at this period are traced by a line of place-names in *-scheid*, including part of northern Lorraine. There is evidence (Sidonius Apollinaris, quoted by Bremer) that their German speech was used on the lower Moselle about A. D. 472.

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Until this time and somewhat later the Franks were ruled by petty kings of their independent tribes. Clovis (Chlodovech, reigned 481–511) was one of these kinglets who increased the power of his tribe by making use of his neighbours and finally putting them out of his way. In 486 he drove out Syagrius, the last Roman governor of northern France, and moved his capital from Tournai to Soissons. In 496 he overthrew the Alamanni on the plain of Alsace (not at Tolbiac —i.e. Zülpich, south-west of Cologne—where the battle has been incorrectly located) and annexed their territory west of the Rhine. In 506 he completed the conquest of the Alamanni, and in 511 died at Paris, master of all France except Burgundy and a small district in the south. His son Theodoric in 531 annexed Thuringia and in 534 Burgundy; and the realm of the Franks grew thenceforward into the empire of Charlemagne.

The name of Alsace appears first about 642 in the adjectival form *Alesacius* and must have been in use earlier. Ermoldus Vigellus, about 830, said that it was a name given by the Franks; but early Frankish writers do not happen to use it in extant works. The word may be Frankish or Alamannic, and its original form would be *Alisaz* = 'foreign settlement', i.e. of Franks across the Vosges, or of Alamanni across the Rhine. As a whole it is the country taken from Alamannic rule in 496 by the Franks. Since Clovis became not only a Christian but the champion of orthodox Christianity, the general conversion of the Franks must have followed at no long interval. The date of the Frankish 'duke' Eticho, who ruled Alsace, is placed in the seventh century, with the legend of his daughter Odilia (Ottilie), born blind and receiving her sight at baptism, after which she became the local saint. The story is identified with the Odilienberg, in the centre of Alsace, where the nunnery dedicated to her was placed among the remains of a great Gaulish fortress, the Heidenmauer, said to have been held by Eticho, whose home is traditionally located at Oberehnheim, a little to the eastward. Eticho's sons ruled as Frankish chiefs; his grandson Eberhard, who lived in the first half of the eighth century, was count of Alsace. From Eticho most of the great ruling families, including the Habsburgs, traced their descent.

Towards the end of the sixth century many monastic settlements were formed on both sides of the Vosges, some of them

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by missionaries whose teaching was derived from Ireland and Iona. There had been Romano-Gaulish churches earlier; bishops of Strasburg and Metz are dimly mentioned in the fourth century; but the conversion of the Frankish and Alamannic settlers was the work of monks and hermits from the west. Chief among these was Deodatus, founder of St. Dié; Mansuetus, a 'Scot' (i.e. Gael), evangelized Toul; Fridolin, an Irishman, about 509 built (according to tradition) an oratory near Forbach; and Plentius Agentius and Columban of Moyenvic are dated in the fifth century.

Charlemagne and his Successors

Charlemagne had royal domains in Alsace; among them a palace at Schlettstadt and a *domus regia* at Colmar. He died in 814, and in 843 his three grandsons divided the Frankish empire by the Treaty of Verdun. Lothaire, the eldest, took the middle share, including roughly Italy north of Rome, all the eastern side of France, with Alsace and the greater part of Belgium and Holland. That Alsace was within his dominions is seen from such transactions as his gift of property in Schlettstadt to an ally in Zürich in 869. The centre of his empire was distinctively *Regnum Lotharii* (so named in 850), or as written in 911 *Lotharii regnum*, whence Lotharingia, Lothringen, Lorraine.

On the death of his son, Lothaire II, Charles the Bald, king of the Western Franks, and Louis the German, king of the Eastern Franks, after some fighting over it, divided the northern half of the middle kingdom—this long belt of territory—between themselves, by the Treaty of Meerssen, 870. They left their nephew, Louis II, only Provence and parts of Burgundy and Italy.

By the Treaty of Meerssen, as German authors do not fail to point out with emphasis, Alsace and northern Lorraine (the present *Reichsland* or German Alsace-Lorraine) fell to Louis the German. Charles of France held the bishoprics of Toul and Verdun and probably the abbey of Gorze and its possessions. The boundary ran up the Ourthe to the Moselle; crossed the Moselle several times, especially near Toul; then ran west, evading the Meuse and following the previous bounds of Lorraine; near Langres it took a curve eastwards through Burgundy towards Châlons. In this division there was no

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attempt at racial, linguistic or political grouping, nor was the division recognized by the dispossessed Louis II, who appealed to the Pope in vain ; it was an arrangement to suit the local lords of the land and their leanings to east or west. Charles the Bald indeed wrote to the Pope that 'his nobles declined spiritual interference with secular matters '.

But Charles the Bald of France succeeded Louis II (died 875) as Emperor, and at the death of Louis the German (876) tried to annex eastern Lorraine and the Rhine province. He failed, and the borderland remained with the East Frankish group of states for the time. It had been given in 867 by Lothaire II to Hugo, his illegitimate son by Waldrada, a descendant of the Alsatian Count Eberhard and Eticho ; but in 878 the three sons of Louis the German (who had then died) in dividing their possessions assigned it to Charles the Fat, the youngest brother. Hugo held it in spite of him for a time, but in 882, by the death of his brothers, Charles the Fat had come to be master of all Germany. He promised Alsace-Lorraine to the joint kings of France, Louis and Carloman, grandsons of Charles the Bald, for their help against Burgundy and the Northmen, then ravaging the north of Lorraine and Germany. Hugo joined his brother-in-law, Godfrey, the leader of the Northmen, to recover his provinces ; but Godfrey was betrayed into the power of the Emperor and Hugo made prisoner and blinded (885), and then the Emperor Charles the Fat refused to fulfil his promise to the French kings Louis and Carloman, and Alsace-Lorraine remained in his hands until 887, when he was deposed.

His successor in the kingdom of Germany and in the Empire was Arnulf, illegitimate son of the Carloman (828–880) King of Bavaria and Italy who was eldest son of Louis the German. In 888 the Emperor Arnulf held a council at Mainz attended by all the ecclesiastics concerned in these provinces, except the Bishop of Toul, and by Count Odo, a scion of the house of Capet, who, on the invitation of a strong party of nobles, claimed the throne of Neustria or northern France. Against Arnulf and these allies stood King Rudolf of Burgundy and the Bishop of Toul, who invaded Lorraine and were repelled. A cousin of Odo, Count Megingoz, appears to have been appointed Duke of Lorraine ; he was opposed by three local counts, Stephen, Gerard and Matfried, and was slain in 895.

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Now Arnulf had an illegitimate son Zwentibold, and no other son until Louis the Young was born in 893. He had declared Zwentibold his successor, but this was made void by the birth of Louis; and in compensation he now raised Zwentibold to the kingdom of Lorraine (Diet of Worms, 895). Odo was recognized as King of Neustria at the same time, but opposed Zwentibold, as did many powerful nobles of the new kingdom. This kingdom included not only most of the present Lorraine, but parts of 'Lower Lorraine' (to north of the later province) with Upper Burgundy, Alsace, and the Breisgau—an artificial group of provinces which Zwentibold was unable to hold. In Lower Lorraine he was opposed by Counts Reginhard and Odoacer; in Upper Lorraine by the three who had resisted Megingoz: and he was forced to call to his help his young brother Louis, who had succeeded Arnulf (died 899). In 900 the nobles did homage to Louis at Thionville, but were still in revolt against Zwentibold, whom they defeated and killed in a battle on the Meuse in the same year.

Thus Alsace-Lorraine reverted to the German Crown, and no further king was appointed. In 903 two *duces regni* were nominated—Gebhard for Upper and Reginald for Lower Lorraine, and the old *Lotharii regnum*, long since shorn of its southern realms, fell apart into these two divisions of which Upper Lorraine roughly coincided with Lorraine as we now know it, and the lower province included Flanders and the lands to the north. We have to follow the fortunes of Upper Lorraine only.

Count Gebhard, descended from the old royal house of the Salian Franks, and his brother Conrad kept up the struggle with the local nobles and overcame them. Conrad died in 906, leaving a son Conrad, whom the German nobles elected king on the death (911) of Louis the Young, last of the line of Louis the German. The nobles of Lorraine then offered the lordship of their country to Charles the Simple, king of France.

Charles the Simple (879–929) had wrested part of his realm from Odo, at whose death in 898 he became king of the Western Franks. He was now husband of Eadgyfu, daughter of our King Eadward the Elder, and had just concluded his treaty with Rollo and the Northmen, by which the Viking troubles were ended, at the cost of the cession of Normandy. He was

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free to attempt the occupation of Lorraine, which he not only accomplished, but held the country against King Conrad's attempt to take it by force. Lorraine from 911 to 922 was a part of France, not governed by a duke, but possessing its own court and diet, over which the Archbishop of Trèves presided, Count Reginald of the Hennegau holding a leading position as *marchio* or *demarchus*. Reginald's son, Giselbert, was chosen *princeps* by the nobles of Lorraine, but did not set up an independent principality. After an unsuccessful attempt (920) on Charles's part to conquer Alsace his popularity waned; many Lorraine nobles, led by Giselbert and Odo, count of Verdun, took the side of Robert, brother of the Odo who had been king of Neustria. Their party fought Charles the Simple at Soissons in 923; Robert was killed, but Charles was defeated and spent his last years in captivity.

Lorraine was again debatable ground. It was offered by Giselbert and Bishop Wigerich of Metz to Rudolf of Burgundy, brother-in-law of the Robert who had been killed at Soissons; but King (afterwards Emperor) Henry I (the Fowler) of Germany invaded, captured Metz, married his daughter Gerberga to Giselbert, and appointed him duke of all Lorraine in 928; and there was peace for ten years. In 938 Giselbert, with Hugo, son of Robert, made war on Louis IV of France (son of Charles the Simple and Eadgyfu). Louis invaded and compelled Giselbert and the Lorraine nobles to recognize him as their king (939).

In further hostilities Giselbert was defeated at Andernach and in his flight was drowned in the Rhine. Louis of France thereupon married Gerberga, the widow of Giselbert, and in 940 invaded Lorraine again; but he failed in his attempt, and the provinces remained (not without rebellion) in the hands of King (afterwards Emperor) Otto I of Germany, son of Henry the Fowler. Under him his brother Henry, his son-in-law Conrad the Red, and his brother Bruno, archbishop of Cologne, were successively dukes of Lorraine. It was Bruno who at last reduced the chaos to order.

In 959 the division of Upper and Lower Lorraine was finally accomplished, the temporalities of the three sees of Metz, Toul, and Verdun being separated from the duchy and held directly of the Empire. Upper Lorraine was given to Frederick, count of Bar, 'Dux Mosellanorum' (died 978), whose grandson,

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Frederick II of Bar, died 1033, leaving no son, but two daughters. Duke Gothelau, 'Dux Ripuariorum', of Lower Lorraine and his sons then appear to have acquired power in Upper Lorraine, and when the sons fought over the inheritance the Emperor Henry III intervened. He gave the duchy of Upper Lorraine in 1047 to Albert of Alsace, son of a Count Eberhard of the Nordgau, and in 1048 Albert was succeeded by his brother Gerard, of Gérardmer in the Vosges, who thus founded the long line of dukes represented to-day by the imperial house of Austria.

Lorraine in these earlier centuries was therefore never a dynastic kingdom. It was a debatable land, ill-defined, without unity in itself or permanent attachment to any great power. Its nobles and bishops claimed and exercised a voice in its government; they elected as king whichever of the neighbouring sovereigns seemed at the time to offer prestige or protection. The royal domains gradually vanished in gifts to the Church, and by the tenth century these ecclesiastical holdings had received *immunitas* or freedom from external interference in matters of justice, and in 959 took their places immediately held of the Empire. The rest of the country was then broken up into small counties and lordships, in which the failure of descent created frequent change of allegiance. The duchy, as conferred on Gerard of Alsace, was merely the nucleus of Lorraine as it grew to be; and the land, continually plundered and depopulated, without any special advantages of situation and production, was rescued from barbarism only by the fact that so much of it was in the hands of the Church. Hence the great importance, in subsequent history, of the Three Sees which occupied so large a part of Lorraine.

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CHAPTER X

HISTORY: TO THE FRENCH CONQUEST

Mediaeval Alsace

Alsace, as we have seen, was not always closely linked to Lorraine. It was part of the *Lotharii regnum* in the ninth century, and by the Treaty of Meerssen (870) it was assigned to the East Frankish or German kingdom, but claimed as an under-lordship of that kingdom by Count or Duke Hugo up to 882. Then it formed part of Zwentibold's kingdom until 900, after which it was fought for, at various times in the tenth century, by the eastern and western powers. During that period it seems to have been locally held by native chiefs, deriving their claims, like Hugo, from their connexion with Eticho or other ancient Frankish families. One such is seen in Albert of Alsace, who became duke of Lorraine in 1047; the Egisheim family, descended from Hugo, held the lordship of Lower Alsace in the eleventh century, and the Habsburgs (as they were called later), also from Eticho and Hugo, were Landgraves of Upper Alsace about 1120–30.

The date at which Alsace was formally divided into the Nordgau (North district), or Lower Alsace, and the Sundgau (South district), or Upper Alsace, is not known. But by the twelfth century both were recognized as Landgraviates.

The Landgraviate implied judicial, financial, and military control on behalf of the king, and under his direction. In course of time its powers, in Alsace, were limited by the withdrawal of large portions of territory, such as those given to the bishops of Strasburg, the counts of Horburg, and the abbots of Murbach. Late in the Middle Ages the power of the Landgrave diminished with the waning authority of the Emperor, as against the rights of the many free towns and petty States which had gradually come into being. The Habsburg Landgraviate had very little effective force for control or protection in the Sundgau during the fifteenth and sixteenth centuries. But its claims were still formally held up to 1648 (the Treaty

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of Westphalia), and they embraced jurisdiction, military direction, and control over all lordships, both those holding directly from the Empire and mediately. Outside the Sundgau the Habsburg Landgraves claimed similar rights over Rappoltstein. They controlled all ecclesiastical corporations except Murbach, though the abbey of Lure in Burgundy, a possession of Murbach, was under the protection of the Landgraves. They held various local rights and were conveners of the diet (Landtag) of Upper Alsace. Such were the claims of the Habsburgs of Austria, long after the time when their direct interest and influence in the Sundgau had worn to a shadow.

The descent of the Habsburgs may be outlined as follows. From Eticho, 'duke' of Alsace, was derived Hugo I, count in the Nordgau, one of whose sons, Eberhard, founded the line of Egisheim and Dagsburg, and another, Guntram the Rich, appears to have been a contemporary of the Emperor Otto I. Guntram's grandson, Werner I, bishop of Strasburg 1001–28, founded the castle of Habsburg (in Switzerland), and was brother of Radbot (died before 1045), who married Ida of Lorraine. His son was Werner II, Landgrave of Upper Alsace (died 1096), whose great-great-grandson, Albert IV (died 1239 or 1240), was father of the German king, Rudolf I (died 1291). Rudolf's grandson, Albert II, married Jeanne of Ferrette in Alsace, and dying in 1358 left two sons (with other issue), Albert III and Leopold III, ancestors of the Albertine and Leopoldine lines of the Habsburgs. One of Leopold's grandsons was the Sigismund who mortgaged the Sundgau to Charles of Burgundy, and died in 1496; another became Emperor as Frederick III, the great-grandfather of the Emperors Charles V (died 1558) and Ferdinand I (died 1564). Ferdinand's descendant in the sixth generation was the Empress Maria Theresa (died 1780), who married Francis Stephen, duke of Lorraine, elected Emperor in 1765 as Francis I. From Francis and Maria Theresa the Lorraine-Habsburg house of Austria is descended.

The Landgraviate of Lower Alsace represented (in its relations with the Empire) the early country of the Nordgau. Its first counts were of the Egisheim family (as already noticed); about 1290 the counts of Wörth or Werd became Landgraves, and held office until 1340; then followed the counts of Ottange. These Landgraves, besides holding the office of governor under the Empire with judicial powers, occupied certain lands

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in virtue of their office, including Erstein, the Uffried, and Frankenburg with the Grafenbann; and their courts were held at Erstein, Röschwoog, and Hagenau. But the Wörth family gradually alienated the possessions of the Landgraviate, and in 1384 the Emperor Wenceslaus gave the office and title to the bishop of Strasburg. The bishops continued to act as Landgraves until 1648, when the Treaty of Westphalia transferred the government to the French Crown.

Under these two Landgraviates there were many separate counties, lordships, and towns, the list varying from period to period as domestic alliances, failure of issue, or external pressure rearranged their conditions. The greater counties and lordships (taking them from south to north) were: Montbéliard, from which Ferrette was broken off; the abbey of Massevaux or Masmünster under protection of Ferrette; the great abbey of Murbach; the counties of Horburg, Egisheim, Wörth (or Werd), Andlau, Rappoltstein, and Schirmeck; the abbey of Marmoutier or Maursmünster and the counties of Lichtenberg, Lützelstein, and Lützelburg. Most of these petty States took shape during the period (1096 to 1268) when Alsace was under the sovereignty of the Hohenstaufen dukes of Swabia, some of whom became kings of Germany and Emperors, and were able to grant their bishops and nobles the privilege of holding their fiefs immediately from the Empire, thus making them free of local control except the limited control of the Landgraviates. This Swabian policy was practically one of decentralization; but it seems to have been an attempt to regulate the chaotic condition of the country, for Alsace was under no one dominant authority except the somewhat distant Empire. As long as the Empire could make itself effective, the States of Alsace were held together by it; when it began to fail, there was nothing to prevent anarchy.

Besides these greater States there was the *Reichsritterschaft*, i.e. the minor lordships of Lower Alsace, held directly of the Empire by owners of knightly rank. These covered an area of about 650 square kilometres, and in 1651 numbered one hundred and nineteen separate holdings, scattered over the country. Few were the allodial possessions of the owners; most were fiefs from the Empire, from the Landgrave of the Nordgau, from the bishopric of Strasburg, from the county of Hanau-Lichtenberg and other territorial lordships. This group

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of holders, in the middle of the sixteenth century, formed an association, including all nobles who had a seat on the Alsatian diet (Landtag) and paid the subsidy to the Empire. After the Thirty Years' War this association was renewed and strengthened against the encroachments of France, but was forced to yield to the diplomacy of the ministers of Louis XIV. The minor nobles were the first of the various Alsatian elements to accept French rule, under which they retained their position with somewhat diminished privileges. Their number and character had changed by this time: many non-Alsatian families had taken the place of the old lines, and, whereas a great proportion had adopted Protestantism in the earliest years of the Reformation, there was a tendency under French influence to return to the Catholic faith. The French Revolution put an end to the association with all its privileges.

Under Swabian rule another class of independent communities was gradually forming in Alsace, as elsewhere in that period—towns, in which the inhabitants sought to realize an ideal of self-government, and slowly rose to freedom.

The free cities ultimately formed a league of ten, known as the Decapolis of Alsace. The growth of the league can be given by a few dates:

Oct. 12, 1342. Seven towns—Oberehnheim, Schlettstadt, Colmar, Kaysersberg, Münster, Türkheim, and Mulhouse—joined together for offence and defence for 3 years.

May 20, 1346. The league was renewed for 3 years more.

Sept. 23, 1354. The Emperor sanctioned the formation of a league of the above, with addition of Hagenau, Weissenburg, and Rosheim, under an imperial bailiff (*Landvogt*). In general outline the conditions were: (1) as to external affairs, complaints to be brought before the bailiff and representatives of the towns, all of whom were pledged to support a member, by war if necessary; (2) as to internal affairs, in case of local trouble the neighbouring towns to send help at once; (3) quarrels to be settled by the bailiff; towns that refused his arbitration were to be summoned before the Diet of the league at Schlettstadt.

In 1358 Selz was added by Charles IV; and left the league in 1409.

In 1511 Landau, a town beyond the northern border of Alsace, joined the league.

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In 1515 Mulhouse abandoned the league and joined the Swiss Confederation.

The link between the league and the Empire was the imperial bailiwick (*Landvogtei*), an office already in existence at Hagenau on the formation of the Decapolis, and distinct from that of the Landgraves, though similar in the fact that it exercised such powers as the sovereign himself would exercise, were he present. The bailiff could appoint and remove all justiciaries, local bailiffs, and administrative officials. His authority was to be respected by all classes, but corporate bodies could appeal from him to the Emperor. He was not appointed for any definite term: changes were made at a fresh succession to the sovereignty or at the Emperor's pleasure. From the middle of the fourteenth century it became not infrequent to alienate the office temporarily by mortgaging its revenues; at such times the work was carried on by vice-bailiffs. After 1400, when the Elector-Palatine Ruprecht was chosen king of Germany, the bailiwick, in the hands of his family for a hundred years, was more efficiently managed, and represented the unity of interests between Alsace and the Palatinate. This period ended in 1504, when the Elector Philip was in opposition to the Emperor Maximilian, and the bailiwick was in Habsburg hands until 1530. From 1530 to 1558 it was again pledged to the Electors-Palatine, and taken from them only when the Emperor Ferdinand wished to oppose the Reformation, which the Electors fostered.

Then followed the second Austrian tenure of the bailiwick. In the later part of this period Austrian influence was weakened by the capture of Hagenau, the centre of the bailiwick, by the Swedes in 1633, and it came to an end with the Peace of Westphalia, 1648.

The history of these offices (Landgraviate and Bailiwick) is the only history of mediaeval Alsace as a whole. The inner life of the country cannot be seen without taking each separate State and town as a unit, and tracing its rise and progress independently. To do this thoroughly and completely is more than can be attempted here; short notices of the principal counties and cities will give sufficient detail to form an idea of the complicated structure which survived the Middle Ages and offered to France in the seventeenth century the problem of welding Alsace into unity.

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The States of Alsace

Montbéliard (Mons Biligardis, German Mümpelgard) was a country astride the southern border of Alsace and Burgundy. The lordship was inherited from the sons of Eticho by the early counts of the Nordgau, and came by marriage to Louis, count of Mousson (Lorraine), who held it till 1044. His son Theodoric held it with Bar, Mousson, and Verdun. In 1125 Ferrette was separated under Frederick, Raynald received Bar, and Montbéliard was held separately by Theodoric II. In 1284 it was recognized as a fief of the Empire, and held by marriage by Raynald, count of Burgundy. In 1396 it came by marriage to Württemberg. In 1793 it was united to France by a decree of the National Assembly.

Ajoie (Alsegaudia, German Elsgau) was the southern part of Montbéliard, now the district of Porrentruy as part of Switzerland.

Ferrette (German Pfirt) was a fortress in the foothills of the Jura, near which the town of Ferrette grew up. In 1125 the surrounding district was divided from Montbéliard as the inheritance of Frederick, who called himself Count of Ferrette. His descendants, always at war with their neighbours, but more successful in negotiations, gradually acquired great part of the Sundgau, including Altkirch and Thann. The last of Frederick's line left in 1324 a daughter, Jeanne, whose marriage with Albert 'the Wise' of Austria brought Ferrette to the Habsburgs. In 1648 it became French, in 1659 it was given to Mazarin, whose representatives, the princes of Monaco, still use the title of Counts of Altkirch.

Altkirch was a village of Montbéliard in the eleventh century; the castle and town were built in the thirteenth. Bâle, under its bishops, claiming supremacy in the Sundgau, fought for it with Ferrette, which bought the town from Bâle in 1271. Before 1348 there was an endowed school at Altkirch. In 1371 it was plundered, and all the men massacred by the so-called English free-company under Ingebram de Coucy, who had invaded Alsace to claim his wife's inheritance. In 1439 it was sacked by the Armagnacs; taken by the Dauphin in 1444; raided by Bâle in 1446; heavily punished by the Austrians for its share in the Peasants' Revolt of 1525; besieged by the Swedes in 1632, and rescued by the Sundgau peasants in 1633. In 1635 it was taken by the French.

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Belfort, a Gallo-Roman site, belonged to Ferrette. It was besieged in 1633 and 1634, and was the scene of a battle in 1635 between the duke of Lorraine and the Franco-Swedish army. Ceded to France in 1648, it was fortified by Vauban, and besieged in 1814 by the Allies and in 1815 by the Austrians. In 1870–1, under Colonel Denfert-Rochereau, it resisted the Germans from Nov. 3 to Feb. 15.

Thann appears as a town in 1304, and was walled in 1364. In 1314 it reckoned 300 burghers; in 1628, 3,286 inhabitants over 7 years old; in 1675, after the Thirty Years' War, only 140 burghers were left. There was no period in which it had not suffered from war, plague, floods, and local disorder. As a place of pilgrimage (to a relic said to have been imported in 1160, the thumb of St. Theobald of Gubbio) it remained Catholic at the Reformation, and there were no religious disturbances. Between 1572 and 1620, 152 persons were burnt as witches. Thann was not a free town; its government was carried on by a steward (*Schaffner*), nominated by the count of Ferrette, two magistrates elected by the townsmen, a town clerk, and eight councillors. After 1549 and again after union with France this constitution was somewhat modified. The town had a mint from 1387, silver for the coinage being mined in the neighbourhood.

Massevaux or *Masevaux* ('Masonis monasterium', German Masmünster) was founded in 728 as a Benedictine monastery by Maso, grandson of Eticho. In the thirteenth century it contained 18 noble ladies, 6 monks, and 3 chaplains under an abbess, and down to the French Revolution its school was famous. A town grew up round the abbey and in 1215 was fortified. The 'English' free-company took the place in 1375; in 1633 it was stormed by the Rhinegrave Otto Ludwig. The overlord of the abbey was the bishop of Bâle, under whom the counts of Ferrette were secular protectors. Their bailiffs, by the middle of the fourteenth century, had become lords of Massevaux as a fief of Austria; the family produced several notable persons, but died out in 1572. The last lords before the Revolution were the ducs de Broglie, who called themselves barons de Massevaux.

Murbach was founded as a Benedictine abbey before 727 by Count Eberhard, grandson of Eticho, on his own estates at 'Maurobacous in the wilderness of Vosagus' (the Vosges), and

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in 728 it received privileges from King Theodoric and Bishop Widegernus of Strasburg, exempting it from the jurisdiction of the bishops of Bâle. Its possessions then, centring in the two valleys of the Thur and the Lauch, reached to the present border of Switzerland, the Rhine, and Belfort. Under Charlemagne it acquired the valley of St. Amarin, and in the next period grew to great importance. The Emperor Frederick II in 1228 named the abbot, who accompanied him to the Crusade, *princeps noster*, i. e. prince-abbot of the Holy Roman Empire. The secular bailiffs (*Landvögte*) of Murbach in the twelfth and thirteenth centuries were Habsburgs, who were bought out in 1291. From the fourteenth century the abbots held also the Burgundian monastery of Lure. Under Bartholomew of Andlau (1447–76) the library was catalogued and various literary works were undertaken; at Murbach the MS. of Paterculus was preserved; thence came to the Bodleian the MS. containing Old High German hymns, published by Sievers in 1879. As a member of the Empire the abbey opposed the Reformation, and was sacked by the peasant insurgents in 1525, but soon recovered its power. It had the right of coinage from 1544 to 1679, owning the silver mines, then profitable, as well as iron-works in the valley of St. Amarin. In the Thirty Years' War Murbach suffered like the rest of Alsace, and at the Peace of Westphalia (1648) was transferred to France. In 1764 the community removed to Gebweiler, where their new buildings bore the title *Insigne collegiale equestrale de Murbach*. Fragments and monuments of the eighth century and onwards remain at the old site, ruined in 1789 by a popular rising.

Egisheim (SW. of Colmar), a site with Stone Age, Bronze and early Iron Age, Roman, Alamannic and Frankish remains, was the seat of Count Eberhard (see *Murbach*), and named as Egenesheim in 817. Eberhard's line became extinct in 1144, and Egisheim went to the family of Dagsburg (see below). After the failure of the Dagsburg line in 1226 the bishop of Strasburg held the castle and county against Ferrette, which renounced its claim in 1251, and the county became part of the Upper Mundat (*Immunitas*) or episcopal territory.

Horburg (near Colmar) was a castle, destroyed 1162, on a late Roman site. The counts, whose origin is unknown, were represented in 1324 by Walter and Burchhard, who sold the county to their relative Ulrich of Württemberg, but the bishop of

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Strasburg interfered to prevent the complete alienation of the estates. When the original family died out in 1374, part of the county was held by Rappoltstein, with which the last count was connected, under the see of Strasburg, and part by Württemberg, connected with Montbéliard (q. v.). The Württemberg counts built a new castle (1543) and took up the anti-imperial side in the sixteenth and seventeenth centuries. At the Peace of Westphalia (1648) their domains in Alsace were confirmed to them, and their immediate relations to the Empire were recognized. But in the subsequent 'War of Holland' Duke George of Württemberg declared himself neutral, and refused to admit the French into Montbéliard; the county of Horburg was sequestrated and the castle dismantled in 1675, and not restored until the Peace of Ryswick in 1697. A difference arose among George's descendants; the county was again sequestrated until Eberhard Ludwig was recognized both by France and the Empire. Thence to the Revolution France was accepted as overlord, but when Montbéliard was annexed by the Republic Duke Frederick Eugene abandoned his claim to Horburg, for which his son was compensated at the Peace of Lunéville (1801).

Val de Villé (German Weilerthal; NW. from Schlettstadt) in the earlest times formed part of the county of Hohenberg-Ortenberg, the castle of Ortenberg being at the mouth of the valley. It was brought to King Rudolf I of Habsburg by his wife Anna, daughter of Albert of Hohenberg. The valley was ravaged by the 'English' free-company in 1374, by the Armagnacs in 1444–5, by the Burgundians in 1473, in the Peasants' Revolts of 1493 and 1525, and in the Thirty Years' War. After 1648 it was granted to General Zurlauben, and in 1692 the lordship was elevated into a county.

Wörth or *Werd* (between Strasburg and Schlettstadt) was the seat of the counts of Werd, first named in 1109, and Landgraves of Lower Alsace, 1190–1340. Their county included Erstein, the Frankenburg, the Uffried, the Hattgau, Gross-Arnsberg, Brumath (held from Mainz), Hoh-Königsburg with St. Pilt, and Gemar. These possessions were broken up by the last counts of Werd and their successors in the Landgraviate, and a great part of the county passed to the see of Strasburg.

Gemar, a town belonging in early times to Wörth (Werd),

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and earlier still to various abbeys, passed in 1293 to Rappoltstein, in which county it remained, with various intervals of alienation, to the French Revolution. Its history is one of continual calamity: it was seized and fortified 1287 by Rudolf I; captured 1293 by Kuno of Bergheim and then by King Adolf of Rome; besieged 1396 by the Strasburgers, and taken by the bishop in 1400; retaken by Smassman (=Maximin) of Rappoltstein 1403 and 1424; revolted and suffered with the Peasants 1525; occupied by Swedes 1633; taken by Lorraine 1635, and by the French 1636–7. In 1653 only 40 inhabitants were left; in 1667 plague swept the town; in 1674 nearly all the townsfolk had fled before the invasion, and did not return until 1679.

Rappoltstein ('Regnibaldi petra' in 1038, French Ribeaupierre) was a castle built in the eleventh century on a Roman site. Hohrappoltstein, or Altencastel, dates from the early thirteenth century. The third castle, Stein or Girsberg, is mentioned in 1288. This lordship was confirmed in 1162 by the Emperor Frederick I to the church of Bâle; its earlier owners, descended from Reginbold or Regnibald, named in 1022 and 1038, had lately died out, leaving an heiress, Emma, married to Egenolf of Urslingen. To the new line, in the thirteenth and fourteenth centuries, belonged Gemar and Heiteren, Hoheneck (held from Ferrette), Leberthal (held of Murbach in 1507), and Maursmünster (from the bishop of Metz). In 1648 there were seven districts in the lordship—Rappoltsweiler, Gemar, Heiteren, Hoheneck and Urbeisthal, Markirch, Weier im Thal, and Zellenberg.

In 1219 Anselm I of Rappoltstein was an adherent of Duke Thibaut I of Lorraine, but the later lords held of the Empire, with a seat at the Reichstag 1479 to 1597, and were frequently summoned to the Kreistag of the Upper Rhine from 1542 to 1597. To Austrian dukes they owed allegiance for parts of their rights in the fifteenth and early sixteenth centuries; William I of Rappoltstein (1507–47) put himself under the protection of Archduke Ferdinand, who in 1547 took advantage of the youth of William's grandson and successor to withdraw from him the immediate relations with the Empire (*Reichsunmittelbarkeit*), which were never regained.

The last of the male line died in 1673, calling himself 'Count and Lord'. His heiress married the Count-Palatine Christian

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II of Birkenfeld, to whom Louis XIV gave the county of Rappoltstein, which was finally absorbed into France in 1801.

A curious right of this lordship, already an eminent one in 1400, was the 'kingdom of the pipers', or control of all players and vagrants between the Rhine, Hagenau, Hauenstein, and the snows of the Vosges. In 1480 the players held their 'pipers' parliament' at Old Thann; in the seventeenth century they were divided into three fraternities meeting at Old Thann, Rappoltsweiler, and Mutzig; the last meeting-place was shifted in 1686 to Bischweiler.

Ste. Marie-aux-Mines (German Markirch) and its district lay astride of the Alsace-Lorraine boundary. It came into some importance with the development of the mines in the sixteenth century, but suffered in the Thirty Years' War. Late in the seventeenth century weaving was added to mining, and the town has since flourished. It became mainly Protestant at the Reformation.

Andlau, a convent founded 880 by the Empress Richardis, and secularized 1499, kept the imperial rights as a principality granted to the abbess in 1347 continuously until the French Revolution. In 1521 the Emperor granted the ruling family the right to hold courts of justice 'within closed doors'—i. e. the *Vehmgerichte* famous in romance.

Schirmeck, in the Breusch valley, belonged originally to the neighbouring castle of Bärenbach. The new town, walled by 1328, was then called 'La Neufville en Barembac', and had been in the hands of the see of Strasburg for over a century. The bishop's castle, rebuilt 1517, was destroyed by the Swedes in 1633, when the town and district also suffered severely. In 1601 the bishop of Strasburg, Charles of Lorraine, took over from a Nancy mint-master the iron-works at Schirmeck, which continued in working until 1872.

The whole valley north of Schirmeck and the river was an ancient possession of the see of Strasburg, to which was added in the eleventh century a small area north-west of Schirmeck, formerly in the lordship of Dagsburg. This became the bone of contention between the bishops and the counts of Ferrette and those of Leiningen; but the lordship remained in the bishops' hands until the French Revolution.

The upper valley of the Breusch, south of Schirmeck, and running up into the ridge of the Vosges, was known as the

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Ban de la Roche, or Steinthal, from the castle of La Roche or Zum Stein, held as an imperial fief from a date probably as early as the twelfth century. The castle was dismantled by John II, Duke of Lorraine 1452–71, and never rebuilt. In 1580 the district accepted the Reformation. In 1584 the lordship was sold to the Count-Palatine of Veldenz-Lützelstein. On the extinction of that line it was given by Louis XIV to Nicolas d'Angervilliers, Intendant of Alsace. In 1762 the lordship, then in possession of the Marquis de Palmy, was created a county, and in 1771 it was purchased by Baron Dietrich of Strasburg. Its name has become famous from the labours of its pastor, Oberlin, 1767–1826, who reclaimed the land and inhabitants from neglect and poverty.

Marmoutier ('Mauri monasterium', German Maursmünster), near Saverne (Zabern), is said by tradition to have been founded by Leobardus, a scholar of the Irish St. Columban, about 590. It was refounded 724 by the Abbot Maurus as a Benedictine abbey; rebuilt in the ninth century by Bishop Drogo of Metz, whence its connexion with that see, which claimed the Marca Aquilejensis or mark of Marmoutier (between the Zorn, Mossel, and Zinsel). This was held by the family of Geroldseck, under the bishops, until 1390, when the lands were inherited and held in common by the families of Lützelstein, Ochsenstein, and Wangen. The mark was reunited by a count of Fürstenberg, who was bishop of Strasburg, and sold by him in 1705 to its ancient owner, the abbey of Marmoutier. The abbey had been prosperous in the twelfth century, owning about 80 places in Alsace-Lorraine; by 1220 it had fallen into poverty, and was relieved by the gift, from the bishop of Strasburg, of the rich parish church of Marmoutier. In 1525 it was sacked by the peasant insurgents; recovered again, but was plundered by Mansfeld's troops in 1621. In 1705 its fortunes rose once more under Abbot Anselm Moser, but in 1793 its property was sequestrated and the monks expelled at the French Revolution.

The remaining counties, to the north, and grouping with their neighbours in northern Lorraine, together with Salm, will be more conveniently described together under the heading of Westrasia after the chief cities of Alsace have been noticed.

Strasburg was always the principal town in Alsace, probably a settlement of the Celtic Mediomatrici, then a Roman post

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with a residential suburb. In the fourth century the Roman-Gaulish Christians of Argentoratum (as it was still called) are said to have been ruled by a bishop. Occupied by Alamanni and Franks, its name in the sixth century appears as Strateburgo, Stratisburgo, 'the fort on the (Roman) road', which by 831 had become 'Strasburg'.

The first bishop known by name is Ansoaldus, who in A. D. 614 possessed Immunity, or freedom from external judicial control. In the next century his successor received freedom from customs dues, except at certain ports on the North Sea; and in the tenth century the bishop had the privilege of minting coin. Under the Emperor Otto II (973–83) the town was separated from the duchy of Allamania or Swabia and given to the bishop; about this time there was the first important extension of its inhabited area. The second extension was made shortly after the grant by King Philip of Swabia (1205) of freedom under the Empire.

Then followed struggles between the bishop and the townsfolk; a battle in 1262 left the burghers independent of the see. The growth of the aristocratic families' power, however, was resented by the commons; their discontent issued in a revolution in 1332, by which all free burghers were admitted to a share in the government. The new council included 8 nobles, 14 burghers, and 25 representatives of the trades, under two *Stettmeister*, and in 1348, after the Black Death, this widening of the council was increased. In spite of troubles the city was growing. Further extensions of its area were made in 1344, 1374, 1390, and 1441, and when Charles le Téméraire besieged the town (1475) the destruction of buildings outside the walls included two chapels, two abbeys, and 680 houses. By the close of the fifteenth century Strasburg was the leading city in Alsace and famous as a seat of culture and learning, connected with the German development of the Renaissance.

In 1529 it adopted the Reformation; it joined in the Protestant League of Schmalkald, and in the war which followed in 1547. Huguenots were welcomed; in 1575 there were 15,398 French in the town. But this was followed by internal troubles on religious matters, especially from 1592 for twelve years—a strife that was ended by the interposition of Henry IV of France, who appointed the Cardinal de Lorraine to the bishopric and bought off the Protestant leader.

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In the Thirty Years' War Strasburg at first preserved neutrality, but was drawn into the struggle on the side of Gustavus Adolphus in 1631. After his death (1632) and the imperialist successes of 1634 the position of the town became difficult; it was saved only to be brought under French influence. The loss of its independence was completed in 1681, when it was annexed by France.[1]

The towns of the Alsatian Decapolis, in which Strasburg never joined, have a somewhat similar history. Their individual character, however, makes it necessary to say a few words about each.

The Towns of the Decapolis: (a) From 1342

Mulhouse (German Mülhausen) from 720 was an estate of the abbey of Massevaux, from which the rights passed to the see of Strasburg. In 1236 it was agreed that the bishop should hold the town as a fief of the Empire, but his bailiff alienated the townsfolk, and in 1261 they put themselves under the Landgrave Rudolf of Habsburg. The town was then an *oppidum imperiale*, governed by a justiciary, who after 1293 was obliged to be a burgess. In 1347 Mulhouse gained the right of electing its own burgomaster. By this time the noble families of the town had come to open strife with the tradesfolk; the former, feoffees of the Habsburgs, fought for the Austrian interests, while the tradesfolk were tenacious of their rights as held directly of the Empire. By 1449 they had expelled the nobles. The civic government was then in a council of 24, including 12 councillors and 2 for each of the 6 trades-guilds. But against the nobles and the Austrians the town required further help, which they received from the Swiss of Berne and Solothurn in 1466. From 1471 Mulhouse was claimed by Charles le Téméraire of Burgundy under a mortgage from Sigismund of Tirol, and the reduction of the town to 'order' inconsistent with its position as a free imperial city was en-

[1] German historians commonly assert that the *échevins* of Strasburg, who negotiated the surrender of 1681, were bribed by the French to betray the town. There is no evidence whatever of bribery; nor does it appear that the *échevins* acted contrary to the feeling of the town. The most probable explanation of the rather obscure story is that the town wished to become French, but preferred the appearance of yielding to force. This view was given out at the time by Louis XIV's representatives at the various foreign courts.

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trusted to Peter von Hagenbach. The Swiss defended their allies, and Peter was taken and put to death. The Swiss victory at Granson (1476) destroyed the power of Burgundy, but the Sundgau reverted to Austria, and Mulhouse had to contend against the power of the Emperor Maximilian. This led to a closer connexion with Switzerland ; a second temporary alliance was followed by permanent membership of the Confederation (1515). Mulhouse thenceforward was no longer politically Alsatian, but Swiss, sharing in the foreign wars and religious strife of Switzerland. The Reformation began locally in 1523, and the town took the side of the Protestant Cantons ; it was the scene of fierce fighting and harsh reprisals in 1590. But during the Thirty Years' War the Protestant Swiss garrisoned Mulhouse, and saved it from the fate of its neighbours. The French occupation of Alsace left it untouched, but during the eighteenth century French tariffs blocked the development of trade. This cause, and the enthusiasm of the democratic Alsatians for the Revolution, induced Mulhouse to join France in January 1798 by an almost unanimous vote of the Council and General Assembly.

Colmar, a settlement in Roman times, was in 823 ' Columbaria ', a royal vill. Early in the tenth century the Crown estates here were divided, half to the cathedral of Constance and half to the abbey of Payerne (canton de Vaud, Switzerland). Late in the twelfth century Colmar was claimed by the bishop of Strasburg. In the thirteenth century it was an imperial town, with the right (granted in 1222) to bear the imperial eagle on its seal. Colmar stood by the imperialists in the struggles of the Hohenstaufen with the papacy. Rudolf of Habsburg made it his residence for a time, but an impost laid by him in 1284 raised a revolt, and he besieged the town, which resisted successfully. After this the struggle between the partisans of Austria (the Reds) and the Bavarian party (the Blacks) raged until 1331, when a commission of four nobles and five townsmen took over the control for five years and succeeded in restoring order.

Imperial rule by this time was much less effective than formerly, and the towns and lordships of Alsace were practically left to shift for themselves. Colmar took the lead in attempts at self-help, in 1333 joining with other towns to destroy the robber-castle of Walter von Geroldseck at Schwanau (on the

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Rhine near Gerstheim) and in 1388 organizing a compact between the imperial towns on the one hand and the bishops of Strasburg and Bâle with Austria on the other. This compact soon fell through, and Colmar fought the bishop of Strasburg until 1343; but by that time the first steps to the league of towns had been taken. Charles IV, who favoured the league, also gave Colmar its constitution.

Early in the thirteenth century it had been governed by a committee of 10 nobles and 8 burghers; then by a council of 12 under a justice nominated by the king; later by 4 burgomasters and the masters of the trades-guilds. In the fourteenth century it was disturbed by the faction-struggles of the mass of industrial townsfolk against the old aristocratic families and old-established rich burghers, both sides strongly organized into guilds. But from 1331 (the date of the emergency Government mentioned above) the old families declined. The constitution granted by Charles IV in 1347 was formed of 3 burgomasters and a council on which 8 members represented the nobles, 4 the rich burghers, 12 the common burghers from the trades-guilds. A long period of turbulence followed until the imperial bailiff, Duke Rudolf of Austria, besieged and took the town, then in the hands of the nobles, and with the consent of the Emperor put the control into the hands of the trades-guilds. In 1361 a council of 30 was formed: 8 nobles, 2 from the rich burghers, and 20 representatives of the 20 trades-guilds, under three burgomasters, of whom 1 was a patrician and 2 were tradesfolk, each presiding in turn for a third of the year. The command of the town's fighting forces was given to a captain chosen from the masters of the trades-guilds, who soon became the chief person in local government. For administration of justice, as assessor to the imperial justiciary, the council of 13 men, with *échevins* (*Schöffen*, *scabini*) chosen from the trades-guilds, now come into importance. The imperial bailiff had to swear to uphold the corporation and to attend annually to report to the Emperor the result of elections. The town had a seat and voice in the diet of the Empire, and paid its share in subsidies and aids. From 1376 it coined its own money; after 1403 it was a member of a coinage-league embracing Upper Alsace, Bâle, and the Breisgau.

In the fifteenth century Colmar was strong enough to resist the attacks of the Armagnacs and other invaders and to help

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neighbours against them, and wealthy enough to contribute largely to the payment of Sigismund's mortgage which had put the Sundgau under Charles of Burgundy. Colmar contingents fought the Burgundians at Héricourt (1474), Granson (1476), and Nancy (1477).

Luther's books were published here in 1522–4. In December 1524 the magistracy, at the imperial command, deprived one of the reforming clergy of his cure, and the populace, especially the agricultural classes, rebelled. In spite of some concessions the revolt spread and became the Peasants' War, which was put down after great bloodshed by Duke Anthony of Lorraine in May 1525. A reaction against Protestantism followed, and it was only after the Confession of Augsburg (1555) that the Reform became general in Colmar. From 1565 to 1574 it was violently opposed by the Archduke Ferdinand, bailiff for his brother, the Emperor Maximilian II; but the opposition failed in face of the strong attitude of the town, which resisted interference with its internal concerns. After the first imperialist successes in the Thirty Years' War, Archduke Leopold, the bailiff, sent a commission to suppress Protestantism. Reformed members were expelled from the council (1627–8), and there was a great exodus of notable families—a severe blow to the town's prosperity. At the invasion of the Swedes (1632) Protestantism was re-established, though the Swedish garrison was no more welcome than the imperialists. When the Swedes lost power, the French by invitation took possession of Colmar (1635) and made it their head-quarters in Alsace. The town regretted its independence under the Empire, but the Empire could not protect it. Colmar was obliged to accept the protection of France under the Treaty of Westphalia (1648).

Münster, founded before 675 as the Benedictine abbey of St. Gregory, 'Monasteriolum confluentis' (at the waters-meet of the two valleys of the Münsterthal), was free under the Empire in the time of Charlemagne; but in 898 Count Eberhard of Alsace and in 1146 the bishop of Bâle claimed overlordship. By 1235 the abbey had regained its position as an immediate fief of the Empire. It owned by this time nearly all the valley of the Fecht, and a town had sprung up near the abbey, the town of Münster, which in 1354 received from Charles IV the rights of Colmar. There were still quarrels with the abbey

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about tolls and rents, hunting and fishing rights, &c., and with the imperial bailiff about the administration of justice. But these conflicts were harmonized, and in 1490 the town council was composed of 7 members from the villages, 6 from the town, and 3 nominated by the abbot. The Reformation was accepted in the town, and when the vice-bailiff in 1563 tried to effect the election of a Catholic as incumbent of the town church the council appealed to the imperial court of justice and won its case against the bailiff. Trouble with the abbey ensued, at one time amounting to actual fighting, and settled only in 1575 by the success of the Protestant cause. Münster suffered severely in the Thirty Years' War, and by the invasion of the Duke of Lorraine, 1652–3. The abbey took the French side, the town stood for its imperial freedom ; and in 1673 the district was occupied by the French and treated with severity. It was only after Turenne's victory at Türkheim in 1675 that Münster was finally brought under France.

Türkheim (Thurincheim in 896), at the mouth of the Münsterthal, became a walled town in 1312, in which the abbot of Münster claimed certain rights, the Habsburgs exercised judicial powers, and the imperial bailiff administered the functions of the Empire. Under these three conflicting authorities the town went through a long period of trouble, culminating in violent hostilities (1465–6), which were not allayed until 20 years later, when an arrangement was made defining the position of the various claimants. Türkheim was not touched by the Reformation, but in the Thirty Years' War the roll of burghers fell from 300 to 80. The town tried to maintain its freedom under the Empire as against France, and in 1673 was attacked, its fortifications dismantled, and its allegiance to France compelled. It was at Türkheim that Turenne in 1675 won the victory which drove the German and imperial troops out of Alsace.

Kaysersberg owes its name to the foundation in 1227 of a town for the residence of 40 knights of the Emperor Frederick II on land bought from Horburg and Rappoltstein. King Adolf in 1293 gave it municipal liberties, and Charles IV in 1347 exemption from external justiciaries. In 1525 it was taken by the revolting peasants ; as under the bishopric of Bâle it semained Catholic. It was the seat of the imperial vice-bailiff, rubordinate to the bailiff at Hagenau.

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Schlettstadt, as 'Sladistat', is named as the royal domain where Charlemagne spent the Christmas of 775. He gave the chapel of his palace there to the bishop of Chur (Switzerland). Henry II (1002–24) gave the church and a 'court' (probably the old palace) to the chapter of Strasburg. In 1094 Hildegard of Büren granted the chapel of the Holy Sepulchre to the abbey of Conques (south of France), and thus the provost of St. Faith at Conques acquired an interest in Schlettstadt, and shared with the Emperor in the administration of justice. In 1281 the Empire took over the judicial rights, leaving the customs dues to the provost. Thus the town came immediately under the Empire. In the fifteenth century Schlettstadt bought both judicial and customs rights for its own property.

From 1292 it was governed by burgomasters (4, 6, or 8 at different periods) with a council of 2 members from each of the 12 trades, and for important decisions the greater council of 100 burghers was called together. In the fourteenth and fifteenth centuries the town was frequently besieged, and carried on war with its neighbours. Nevertheless its school was famous, and contributed scholars of eminence to the Renaissance and Reformation. But Protestantism was suppressed by the magistracy, and the town remained strictly Catholic; between 1629 and 1642 it burnt 91 persons as witches. In 1632, however, the Swedes entered, and in 1634 the French, and the town endured famine and disease before the French garrison left in 1649. They entered again in 1673, and thenceforward Schlettstadt was under France.

Oberehnheim (French Obernai), as 'Ehinhaim', in 778 was Church property; early in the twelfth century the Hohenstaufen built a palace there. From 1249 it was a free town; at its entrance into the Alsatian League it was governed by burgomasters and a council, justice being administered by an imperial official. It always remained Catholic. By tradition its earliest castle was the residence of Eticho and the birthplace of St. Odilia.

(b) Towns joining the League in 1354

Hagenau was founded by Duke Frederick 'the One-eyed' between 1106 and 1125; it received from his son Frederick Barbarossa in 1164 the rights of a freedom of the Empire. The

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possession of relics (a piece of the Crown of Thorns and the Lance of the Crucifixion) made its fine basilica a place of pilgrimage and contributed to the rapid rise of the town. From an early date it was the seat of the imperial bailiff, and this, with the frequent residence of the Hohenstaufen kings and emperors, brought to it many nobles as citizens. Its charter of 1164 recognized a town council and officers, with trades-guilds. In 1255 King William of Holland granted it a corporation like that of Strasburg—a council of 12, yearly elected, and not confined to the nobles, under a burgomaster. A little later the council, as *échevins*, took part in the administration of justice. Early in the fourteenth century the trades-guilds, now organized and armed, began to overbalance the nobles, and in 1332 were represented on the council by 24 members. In 1379 King Wenceslaus granted them the right of sitting as *échevins*. Hagenau, as seat of the imperial bailiff, was the political centre of the Decapolis. The bailiff at the period of the Reformation (the Prince-Palatine of the Rhine) favoured Protestantism, which was adopted in the town. One of the leading Reformers, Wolfgang Capite (Köpfel), was a native of Hagenau ; and when the Emperor Ferdinand in 1566 tried to restore Catholicism the town council stood firm against him. At the close of the sixteenth century the Jesuits had effected a reaction, and in 1616 the government of the town was restored to the Catholics.

But in 1621 Mansfeld captured the town, and made it Protestant at the cost of great suffering. Tilly drove him out and Archduke Leopold entered Hagenau and replaced the Catholics. In 1632 the Swedes arrived and reversed the situation ; in 1633 the imperialists again captured the town for the Catholic side ; and in 1634 the French, as allies of the Protestants, took possession.[1] The Thirty Years' War was the ruin of Hagenau.

The French Revolution found the burghers mainly conservative ; in 1793 they welcomed the Prince of Condé and the *émigrés*, for which they had to pay by a reign of terror. In

[1] The burghers of Hagenau deliberately placed themselves under the protection of France as the only power able to ensure to them peace and tranquillity. The text of the convention, emphasizing this fact, is interesting (quoted in *Revue des Deux Mondes*, January 1, 1919, p. 218). Hagenau was following the example of Hanau (1633) ; she was in turn imitated by Colmar (1635). The attitude of Richelieu towards these overtures was hesitating, if not positively discouraging.

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1814 the Allies occupied the town. In 1870 it was taken by the Germans.

Rosheim in 778, as 'Rodesheim', belonged to the abbey of Fulda. In the twelfth century it appears as a possession of the Emperor. In 1212 a moiety of the town was mortgaged to the Duke of Lorraine, whose heirs maintained that it had been given to Lorraine, and occupied it but were driven out. In 1558 it came under the Habsburgs, and in 1648 to the French Crown. Its corporation consisted of two burgomasters, a town clerk, and 4 councillors, with an imperial officer for the administration of justice. Like most Alsatian towns it suffered in various wars. It was burnt by the bishop of Strasburg in 1294, sacked by the Armagnacs in 1444, and plundered and burnt by Mansfeld in 1622.

Weissenburg (French Wissembourg) was the Benedictine abbey of 'Uizunburg' in 693, centre of the Lower Mundat (*Immunitas*; see *Egisheim*, p. 172). In 882 it received the right of electing its own abbot. Later it became an imperial abbey free from episcopal jurisdiction. In 1524 Pope Clement VII made it into a secular college of canons, which in 1545 was given to the bishop of Spire. The town is first named in 1178. Under the Hohenstaufens, bailiffs of the abbey, the town grew. King Rudolf I in 1275 gave it freedom from the abbey as to the election of its magistrates, but complete freedom followed very slowly. In 1310 the Emperor Henry VII gave it liberty from external judicial control, and in the fourteenth and fifteenth centuries it went through long struggles with the abbey, which were ended by grants of liberty by King Sigismund, Frederick III, and Maximilian I. In the Peasants' War (1525) the town sided against the abbey, on which the Elector-Palatine and the archbishop of Trier attacked it, and compelled it to surrender its liberties, which were not regained until 1539. At the Treaty of Westphalia (1648) the rights of the bailiff passed to the French Crown, and in 1672 Weissenburg became a royal free town of France. It had been sacked by Mansfeld in 1621, and after the Thirty Years' War only 130 burghers were left. In 1677 it was plundered by freebooters under Labrosse. It was the scene of fighting between French and Austrians in 1705–6 and 1744. The Austrians took it in 1793, and General Hoche retook it later in the year. On August 4, 1870, the first victory of the Germans over the French was won at Weissenburg.

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(c) *Joining the League in 1358*

Selz is named in 968 as a site given by the Emperor Otto I to his wife Adelaide, who founded the abbey in 991. By 1197 the town had grown up. In a war lasting from 1269 to 1274 it was overcome by neighbouring princes, from whom the bishop of Strasburg acquired it. In 1283 the Emperor Rudolf I granted it the rights of Hagenau. Though it had been a free city of the league, in 1409 it was mortgaged by King Ruprecht when Elector-Palatine, with whose successors it remained until the eighteenth century. It became Protestant in 1557, but returned to Catholicism in 1684 under the influence of Louis XIV, who gave the abbey to the bishopric of Strasburg. In 1793 Selz was taken by the Austrians, and in 1815 it was the scene of a battle between the French and Germans.

Landau, which joined the Alsatian League in 1511, is outside the borders of Alsace.

Westrasia

The petty States of northern Alsace and Lorraine in the later Middle Ages popularly called Westrasia (Westerreich, Westrich), as the land within the Empire opposed to Austria (Oesterreich), form a group which can be distinguished from Alsace proper. They were not ancient political divisions, but accretions of holdings—allodial, feudal, and official—gradually brought together into the hands of ruling families whose title of nobility was acquired otherwise than from their possessions. The States embraced populations of various race, language, custom, and political position, without common traditions, except that they were mainly, at one time or other, under the influence of the bishopric of Metz, and all were held from the Empire up to the time of the French occupation of Metz in 1552, of the see of Metz in 1648, and of the duchy of Lorraine in 1766.

The more southern of these little States were built out of the ruins of the ancient county of the *Chaumontois* ('Pagus Calvimontensis' *c.* 671), which covered much of the east of Lorraine. Its counts in the tenth century appear to have been the successors of St. Arnulf, who died at Metz in 640, and to have descended from Drogo, the brother of Charles Martel. Of this line came Frederick of Bar, duke of Lorraine (died 990) and his brother, the count of the Saulnois; the duke's portion

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was inherited by the counts of Bar, and the count's by the house of Lunéville-Metz; and from part of this estate the county of *Blâmont*, known in 938, was formed. Blâmont was held by the bishops of Metz by a branch of the Salm family.

Salm was the name of a castle in the Ardennes, from which originally came Count Hermann of Salm (died 1035), who married Agnes of Bar, and so got the lordship of Langstein, or Pierre Percée, in the western foothills of the Vosges. Their son obtained by marriage the county of Blâmont, and his descendants were bailiffs of the abbey of Senones in the Vosges, under the bishops of Metz. In 1190 they built the new castle of Salm in the Vosges, east of the central ridge in a little valley running up from Schirmeck. By 1258 the counts of Salm, always at variance with the abbey of Senones, had become so impoverished that they had to lease Langstein to Metz. In the fourteenth century they acquired the lordship of Püttlingen (near Saaralben), which had been originally part of Blâmont, and then held successively by Metz and Lorraine. In 1449 two brothers, Simon and John of Salm, divided the inheritance; whence the two counties of Salm. Simon's daughter brought this moiety (the eastern half) by marriage to the Rhinegrave John zu Daun-Kyrburg, whose successors took the name of Salm, and were raised to the rank of princes in 1633. John's moiety went by marriage in 1600 to Francis, count of Vaudémont, who became duke of Lorraine. Both states were immediate fiefs of the Empire. In 1751 the boundary between them was the river Plaine; the old castle had long been abandoned, and the prince's residence was now moved to Senones, near the abbey. This abbey was one of the very early foundations of the disciples of Deodatus, founder of St. Dié, and became a celebrated seat of learning. In the eighteenth century one of its abbots was Dom Calmet, the historian of Lorraine, whom Voltaire visited, staying for a month among the monks and writing his *Essai sur les mœurs*. In 1766 the Lorraine half of Salm became French, with the rest of the duchy; the prince's half remained with the Empire until after the Revolution, when during the famine of 1793, in the time of the embargo on the export of corn from France, it escaped starvation only by joining the Republic. Among the descendants of its princes several became well known in the nineteenth century as soldiers of fortune and literary men.

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Dagsburg (French Dabo) in the picturesque central Vosges, with many megalithic and Roman remains, has the ruins of a castle founded by the bishop of Metz in 1225, and destroyed by the French in 1690. The district, lying in both Alsace and Lorraine, was not a county, but its lords were counts, holding the title personally, not territorially. In the tenth century the castle of Türkstein was held by the counts of Blâmont (in Lorraine); here, it is said, lived the first count of Dagsburg, a relative of the Emperor Conrad II, and father of Pope Leo IX (born 1002). In the twelfth century Dagsburg came by marriage to the counts of Lunéville-Metz; their last heiress married Sigismund of Leiningen, and died 1225, leaving Dagsburg with the Leiningen family. In 1779 the count of Leiningen-Hastenburg was created a prince of the Empire; in 1792 Dagsburg was sequestrated by the French National Assembly, and in 1801 incorporated with France. Türkstein, about 1233, went to the bishopric of Metz, from which in 1344 it passed by mortgage to the duke of Lorraine. The Chambre de Réunion annexed it to France in 1680.

Lorquin ('Launarigum' in 699, German Lörchingen), with Gaulish, Roman, and Frankish remains, was destroyed and depopulated in the war of the early fifteenth century. Later it became seat of the barony of Türkstein.

Lützelburg (in the Vosges, on the river Zorn), a castle on the site of a Roman fort, was seat of a lordship belonging to the abbey of Marmoutier and about 1050 was acquired by a branch of the house of Bar-Montbéliard. When this line died out (about 1130) the bishop of Metz, Stephen de Bar, granted 'Lucelenburch' to the counts of Lunéville-Metz. The castle was taken in 1235 by the lord of Geroldseck, and destroyed in 1260 by Duke Ferri III of Lorraine, but rebuilt by the bishop. It was finally overthrown in 1523 and the lordship united with Lützelstein.

Lützelstein (French Petite Pierre), in the northern Vosges between Bitche and Zabern, was a castle built (about 1200) by a branch of the counts of Lunéville. In 1223 Count Hugo was overcome by the bishop of Strasburg, and a little later three-quarters of his county was held as a fief of Strasburg. The remaining quarter was held in 1403 of the Palatinate, against which the counts rebelled, and were driven into exile in 1452. Thenceforward the Elector-Palatine or members of his family

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held Lützelstein, into which the Reformation was introduced in 1560, the Elector being a Protestant. In 1635 it was taken by the imperialists, and retaken next year by Bernard of Saxe-Weimar. The county, as part of Alsace, was united to France in 1680. Lützelstein was the scene in 1814 of the resistance for two months of the Irish legion, commanded by Captain Richard Wall, against the Russians and Bavarians. The place was fortified until 1870, when it was taken by the Germans.

Pfalzburg (Phalsbourg), with lands from Lützelburg and Lützelstein, was made into a principality by the Emperor Ferdinand V in 1624, and given to Henrietta, sister of Charles IV, duke of Lorraine, on her marriage to Louis of Guiba. On his death in 1660 it reverted to Lorraine, and was annexed by France in 1661.

Lixheim, a town built in a marsh (1608) by the Elector Frederick V as a retreat for exiled Protestants, was sold by him to Duke Henry (1623), who gave it to the Princess Henrietta. It was assigned by her to her second husband, the count of Grimaldi, who was made prince of the Empire with title from Lixheim.

Lichtenberg (near Lützelstein) was a castle mentioned (1260) as held by a family which gave two bishops to Strasburg in the thirteenth century and a third, of great fame, in the fourteenth. The lords of Lichtenberg doubled their possessions in 1332 by acquiring the estates of the Landgraviate from the counts of Werd, and in the fifteenth century obtained Oberbronn and Niederbronn. Jakob of Lichtenberg was created a count by the Emperor in 1458, but at his death in 1480 his possessions were divided between his sons-in-law, the counts of Hanau and Zweibrücken.

Zweibrücken (French Deux-Ponts), or the county 'de Geminoponte', between the Blies and Bitche, in early times included a small strip of land west of the Saar. The counts descended from Henry, a younger son of Simon I of Saarbrücken, in the twelfth century. About 1300 the county was divided between two of the family—Walram, who took the district of Zweibrücken, which went by 1435 to the Palatinate, and Eberhard, whose share (the district of Lemberg) included Bitche, which was held from Lorraine, and was increased by the addition of Brumath, Ingweiler, Oberbronn, and Wörth (on the Sauer) from Lichtenberg in 1480. On the failure of the line in 1606,

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Bitche lapsed to Lorraine, and was granted to the counts of Hanau-Lichtenberg, who already possessed the former estates of Lichtenberg, and held this 'Hanauer land' until 1736, when it passed by marriage to the prince of Hesse-Darmstadt. Bitche, however, had been resumed by Lorraine when Count Philip of Hanau-Lichtenberg brought in the Reformation (1572). After being pledged to the Margrave of Baden and then to the prince of Pfalzburg (1621) it was given by Duke Charles of Lorraine to his natural son, Charles Henry, count of Vaudémont, and so remained with Lorraine. It may be added that after 1572 no Protestants were allowed at Bitche until the time of Napoleon I.

Saarbrücken, named from a Roman bridge, was in Frankish times, as 'Sarabrucca', a royal domain, at which a fort was built. The district was held as a fief of the Empire by a branch of the ancient house of Alsace, and after 1233 passed by marriage to Simon of Commercy. His line died out 1381, and the county went by marriage to the house of Nassau, which held it till the Revolution. Part of the county lay south-west of the Saar, including a portion of the Warentwald (a fief of Metz), the bailiffic rights in Homburg and St. Avold (held from Metz), and other outlying possessions. In 1527 the count of Saarbrücken acquired by marriage the county of Saarwerden.

Saarwerden with Bockenheim—two towns held as fiefs of the see of Metz—added to the allodial estates of a family which was apparently a branch of the counts of Lunéville-Metz, formed a county at the beginning of the twelfth century. Their line died out in 1397, and the county went to the archbishop of Cologne and then to the counts of Mörss; at the failure of the latter in 1527 the part held from Metz was claimed by Lorraine, and the rest was added through marriage to the possessions of the count of Nassau-Saarbrücken. In 1559 many deserted places in the district were settled by Huguenots; these, later, were called *die welschen Dörfer*. The towns originally held from Metz were assigned in 1629 by a decree of the court of justice to Lorraine, which was not satisfied, but forcibly occupied the whole county. Then followed the Swedish invasion, which restored it to Nassau; on this the imperialists invaded, and then Lorraine attacked Saarwerden once more. After the Treaty of Westphalia (1648) the duke of Lorraine gave Saarwerden to the count of Vaudémont. The

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Peace of Ryswick gave it back to Nassau, except the two towns anciently held from Metz. Misgovernment drove the people to a revolt, which was put down by imperial troops. These frequent changes made continuity of life impossible in Saarwerden ; but in the eighteenth century the county was mainly Protestant, as it had been in the sixteenth.

Faulquemont (German Falkenberg), in 1125 ' Falconismons ', between Metz and Saaralben, was an early fortress, seat of a lordship belonging to the see of Metz, and held by a family from the Eifel district. Lorraine acquired the overlordship at a date unknown, and the fief passed to a branch of the family of Fénétrange (Finstingen), from whom in the sixteenth century Leiningen, Lützelburg, and Salm derived interests in Faulquemont. One part came from Fénétrange to Kriechingen and Harraucourt ; the last family, having acquired also the Lorraine share, was raised in 1629 to the marquisate.

Fénétrange (German Finstingen), a walled town, was seat of a lordship held, from the sixteenth century, as an immediate fief of the Empire. In the eleventh century the place was owned by the abbey of Remiremont, whose bailiff there was Bruno of Malberg. His sons founded two lines, known from their crests as the Brackenkopf and the Schwanhals. The share of the former came, after 1472, to Lorraine, and later to Salm. The Schwanhals' portion was divided in 1467 between the count of Mörss-Saarwerden and Ferdinand of Neufchâtel-Montagne, whence ultimately (in the eighteenth century) to Lorraine.

Kriechingen, castle and town (near Faulquemont), was owned in the twelfth century by the lords of Malberg, who took the name of Kriechingen, and by a series of marriages increased their possessions until in the seventeenth century they were the wealthiest landlords of Lorraine and Westrasia. The line divided in 1531 into Kriechingen-Pittingen-Baccarat, who were Calvinists, and Kriechingen-Homburg-Bruchkastel, who were Catholics and were raised to the rank of Counts of the Empire in 1617.

Homburg on the Canner (ESE. of Thionville) was the seat of a county originating in an allodial estate given to the abbey of Gorze in 898. It came later to the Kriechingen family, and when Peter Ernest of Kriechingen, who was made a count in 1617, was dead his widow, a niece of the famous Admiral

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Coligny, received the title of Countess of Homburg. Under French rule the district became a county.

Boulay (German Bolchen), originally a fief of Faulquemont, was a domain of Lorraine from 1503. In 1614 it was made a county on being given to Louis d'Ancerville, natural son of Cardinal Louis of Guise.

Blieskastel (east of Saarbrücken and Saargemünd). The *comitatus Blesensis* is named in 831 as under Count Odoacer (p. 162). At the end of the tenth century it was under the counts of Lunéville-Metz, who were counts of this district, the Bliesgau. The last of the line died in 1238 leaving seven daughters, among whom the county was broken up; part of it was sold in 1326 by the see of Metz to Trier.

Nomeny, an imperial margraviate (marquisate) with some parts lying in France, was formed out of fragments of the bishopric of Metz and county of Bar united to the castle of Nomeny and the Ban de Delme. Nomeny itself was held by Metz as early as 821; Delme appears to have been originally a holding of Lorraine, granted in 1238 by Duke Matthew to his brother, the bishop. In the fourteenth century Nomeny and Delme seem to have been united under a castellan of the bishop's, seated at Nomeny. In the sixteenth century the lordship came into the hands of the titular count of Vaudémont, son of the duke of Lorraine, and in 1567 the Emperor Maximilian II created it an imperial margraviate. A decree of the Chambre de Réunion at Metz in 1680 united it to France; but the title of marquis of Nomeny was still held by Francis of Lorraine after he had given up that duchy and become Emperor of Austria.

Forbach (SW. of Saarbrücken), a small walled town, was seat of a lordship under Lorraine, which was held at first by an abbey in Verdun, then by the Alsatian counts of Werd, and in 1461 by the Teutonic knights of Saarbrücken.

The Val de Vaxy (north of Château-Salins) was the site of two lordships, one seated at Hédival and held from the thirteenth century by the counts of Salm, and the other belonging from the earliest times to the abbey of Gorze, which may conveniently be mentioned here, though not strictly a Westrasian State, but as independent both of the bishoprics and duchies.

Gorze (SW. of Metz) was a Benedictine abbey before 765, when it is named Gorzia, and endowed by the Carlovingian

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kings with considerable territory, part of which was held as allodial or freehold, independent of the Empire. After a period of indiscipline in the eleventh century, it became the centre of a great monastic reform on the Cluniac model, and continued to grow in wealth and influence, and the house was enlarged and fortified. A town grew up near the abbey, which for secular defence put itself under the protection of the counts of Bar in 1298, and in the fifteenth century sought the help of the French Crown against the encroachments of Metz. In the fighting of that period the town was frequently plundered ; in 1542 it was seized by Count William of Fürstenberg, then holding Nomeny, who introduced the Reformation with the famous Protestant Farel for preacher. This brought upon Gorze the attacks of Duke Claude of Guise, of the house of Lorraine. The Peace of Crépy (1544) assigned Gorze to the Emperor as duke of Luxemburg, but in 1552 France took over Metz and district, not including Gorze, which was the object of continued attacks ; both abbey and town were more than once sacked and finally burnt and the castle destroyed. The treasure of the abbey had been stored in the crypt of Metz cathedral, where in 1584 it was seized by the Lorrainers and melted down. All that remained of the abbey's possessions came into the hands of the duke of Lorraine.

The Three Bishoprics: Metz, Toul, and Verdun

The mediaeval history of Lorraine is complicated by the struggles of the duchy with the three bishoprics. The dukes at first exercised a general vice-regency over the area of 'Upper Lorraine' as a province of the Empire, together with ownership of fiefs from the Empire and from France. Within the whole area one little State after another gained independence under the Empire, and was withdrawn from the interference of the dukes. Chief among these were the bishoprics of Metz, Toul, and Verdun, which owned possessions scattered over the map, and varying from period to period, alien and often actively hostile to the interspersed lands belonging to the duchy or to nobles in association with it. The reassertion of ducal authority over the whole of Lorraine was the work of the later Middle Ages, and was not accomplished until the power of the Empire had waned before the rising power of France.

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But the dukes were not the only enemies of the bishops. The towns of Lorraine, like those of Alsace, though to a less degree, were developing ideas of independence, and struggling against the bishops for freedom. To that end they sometimes called in the aid of the dukes, and later that of France. The history can hardly be generalized; it can be gathered best from short notices of the chief towns taken separately.

Metz

Metz, as Divodurum of the Mediomatrici, was first a Gaulish town and then a Roman station, which grew to importance and resisted the attacks of the barbarians until it was partly destroyed in 451 by Attila. It came into the hands of the Franks late in the fifth century, rather by settlement than by capture. In 511 it was the residence of Theodoric as king of Austrasia, and here Queen Brunehault (Brunhilda) held her court, at which the poet Venantius Fortunatus and the historian Gregory of Tours were received. A Christian church existed at Metz before the building of the fifth-century oratory of St. Stephen; and in the sixth century a greater church was founded and served as cathedral until the tenth century. The abbeys of St. Glossinda (Glodesinda) and St. Peter are named at the beginning of the seventh century. The Carlovingian royal family also favoured the town: Charlemagne's wife and several of his children were buried here, the Emperor Louis the Pious was both crowned and buried, and Charles the Bald was crowned at Metz king of France in 869. In their days it was a centre of culture; its schools of book-illumination and music (the latter founded by Bishop Drogo, 823–55) were famous, and the builder of the cathedral of Aachen was Odo of Metz.

At the division of the Empire in 870 the town fell to the Eastern Frankish kingdom; but the weak rule of Charles the Fat and Louis the Child disgusted the Lorrainers, who put themselves under Charles the Simple of France in 911. Metz became French until the Emperor Henry I regained it (925). Some of the rights of the counts of Metz were acquired by Bishop Adalbero I (929–62), adding to the great influence of the see. Adalbero's successors were Bruno, a brother, and Theodoric I, a cousin of Emperor Otto I. Adalbero II (984–1005), Adalbero III (1006), and Theodoric II (1006–47) were

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relatives of the royal house. The bishops in this period derived their great authority from close personal connexion with the Empire or the eastern kingdom, which enabled them to build up the temporal power of the see. Not that they were merely secular potentates. Adalbero and Bruno promoted the Cluniac reform (already mentioned on p. 193); Theodoric founded new churches; the rich monkish literature of the age reflects a spiritual movement in which the bishops were leaders.

But in the eleventh century the townsfolk of Metz, hitherto subservient, began to form ideals of self-government, and in the twelfth century they proceeded to realize them. Bishops Theoger (1118–20) and Stephen of Bar (1120–68) were treated as opponents by the townsmen, whereas Adalbero had been their best friend. Under Bertram, a Saxon (1179–1212), and alien to the mainly French character of Metz, the people stand apart from the bishop as a *universitas civium* with the *tredecim jurati* as their representatives. They were far from being fully emancipated; Bertram in 1180 put the choice of the master of the college of *échevins* (*scabini* or judicial assessors) into the hands of a group of abbots and cathedral dignitaries, and the XIII *jurati* were nominated by the bishop himself. But 25 years later the assessors of the XIII in the administration of justice were elected by the people, and formed the only quasi-democratic element in the constitution.

Metz was never thoroughly democratic, like some of the Alsatian towns; the old families of noble or wealthy burghers always held a preponderance of power. In the thirteenth century it was already in the hands of the five *paraiges* or aristocratic guilds of Porte Moselle, Jurue, St. Martin, Porte Sailli, and Outre-Seille. All the rest of the burghers, called the Commune, were represented as a single extra *paraige*, which thenceforward merely augmented the aristocratic forces opposed to the bishop on the one hand, and on the other to the trades-guilds. In 1300 the *paraiges* got the right of electing the *maîtres des échevins*; later, that of appointing the XIII *jurati*; and in 1383 they acquired the mint, formerly held by the bishops, who by that time had been driven out of their own chief city and forced to take up residence at Vic.

The trades-guilds meanwhile had been fighting with the aristocratic *paraiges* for their freedom, but not with the success of those in Alsace. In 1335 the jurisdiction of the *grand*

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maître des métiers was suppressed, and in 1382 the *fréries* themselves lost their power. The last rising of the tradesmen in 1405 failed, leaving Metz with an aristocratic government in the hands of the *paraiges* until 1552.

Turning to the town's external history, we find it chiefly concerned with struggles against powerful neighbours, the kings of France, the dukes of Luxemburg, Bar, and Lorraine. In 1324 these potentates and the archbishop of Trier joined the bishop of Metz against the town, and carried on hostilities for three years. In 1363 and 1365 the 'English' free-company under Arnold of Cervola attacked the town and extracted heavy blackmail. In 1426 a long war with France and Lorraine began; the duke was repelled in 1444, but the town had to pay Charles VII of France a ransom of 200,000 golden florins (£100,000 sterling, worth in those times over a million of our money). The dukes of Lorraine pushed the war with endeavours to divide the burghers against one another. France on the other hand now tried to win their confidence; Louis XI offered his protection against all enemies, protesting in 1464 'qu'il n'y ait cité en tout ce saint empire qui de meilleur cuer luy voulaist faire service que ceste ici'. Metz was, till then, an imperial city; in 1354 and 1356 Charles IV had held imperial diets there; but now the Emperor gave no help and seemed to abandon it. There were sieges in 1363, 1365, 1438, 1444, 1489; every generation had been exposed to the horrors of war. It began to be debated whether Metz was, after all, a member of the Empire or an independent border State, free to take protection from the strongest party; and in the first half of the fifteenth century religious difficulties tended still further in the same direction.

The Protestant preaching of Guillaume Farel, from 1525 onwards, issued in an attempt in 1542 at official reform of religion. This failed, owing to the opposition of the Cardinal de Lorraine; but it left a strong Protestant party, favoured by the French diplomacy of the period, which took the Protestant side as the one opposed to the Empire. The bishop, in the French interest, joined with these; and in April 1552 their party in Metz opened its gates to the constable Montmorency. King Henry II made a personal entry on Palm Sunday as *vicarius sacri imperii et urbis protector*, and Francis, duke of Guise, held the town against the army of the

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Emperor Charles V from October 19 to New Year's day, 1553, when the imperialists retreated with only 12,000 out of the 60,000 men they had brought to the siege. The French claimed to have lost only 250 men, but the suburbs of Metz were destroyed, including five abbeys and nineteen churches.

The ruling power in Metz was now a French governor, representing the Crown, which assumed all rights formerly exercised by the Holy Roman Empire. As the Empire had long since failed to take part in the affairs of the town and see, the new rule of a nearer power was somewhat more felt. The *paraiges* lost their irresponsible position; the *maître des échevins* was nominated by the governor, who appointed also the *échevins*, no longer from the *paraiges* only, but from the body of the burghers. The XIII *jurati* were similarly appointed, and sat under the presidency of a royal officer. As some compensation for the loss of independence, the *Trois États*, established at Metz, gave a means of dealing directly with the French Court in important affairs. Over this loss of the town's autonomy German historians lament; but it had proved a failure; externally the Empire had been powerless for protection; internally freedom had not been realized. The French protectorate afforded military assistance and a step towards greater liberty for the individual—at least, for more than a century, until the Revocation of the Edict of Nantes in 1685.

In 1633 Louis XIII established the Parliament of Metz, which had under its jurisdiction the town, the *pays messin*, the three bishoprics, the abbey of Gorze, and a number of isolated places. From 1637 to 1658, owing to local opposition, its sittings were removed to Toul; during that period its jurisdiction increased, upon the inclusion of Lorraine and Bar in the French kingdom by the Treaty of Westphalia (1648). In 1681 the *Chambre de Réunion* of Metz, like that for Alsace at Breisach, with powers to determine the standing of various lordships and rights, was added to the parliament.

After the Revocation of the Edict of Nantes there was a great emigration of French Protestants from Metz, taking with them much of the trade of the town. In 1552 there had been 60,000 inhabitants; in 1698 there were only 22,000, and the population did not recover until the nineteenth century.

At the French Revolution the parliament was replaced by

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a directory of eight members under a president; and the military commandant took the place of the governor. Metz became chief town of the new department of the Moselle, which included the ancient *pays messin* or district of Metz, some towns in which are worth separate mention.

Vic was a pre-Roman village with salt-works (the ruins of which form the *briquetages*, now dated to about 800–400 B. C.), named in a Roman inscription 'Vicus Bodatius'. From Frankish times many abbeys had interests in the salt industry here. By 1093 the town belonged to the bishops of Metz, who fortified it in 1196. In 1206 the count of Bar carried off a hundred of the inhabitants as prisoners and dismantled the walls, which were rebuilt by the bishop. In 1272 it was taken by Lorraine and returned to Metz two years later. It is noted that the first clock made in France was the work of a man of Vic, named Henry, living in 1323. The fourteenth century brought strife between the bishops and townsfolk, resulting in the confirmation of the town's privileges and the appointment of a castellan and a judge (1344), and a gradual increase of local self-government. But Vic, the usual residence of the bishop at this period, was the scene of fighting from time to time. In 1630 the town was besieged by the imperialists, but relieved by Marshal de la Force; in 1635 Bernard of Saxe-Weimar and the Swedes attacked it. The bishops, though they lost the temporal lordship in 1648, rebuilt the castle 1669–97, and founded in 1747 an educational college at Vic.

Moyenvic, on Merovingian coins 'Medianus vicus', also built on a 'briquetage', is mentioned in 836 as a site of the salt industry. In the fifth century it had been the scene of the mission of SS. Plentius Agentius and Columban, to whose memory a very early abbey was founded. Later, a priory of the abbey of St. Mansuetus at Toul took its place. In the thirteenth century Moyenvic came under the bishop of Metz, and was destroyed in the fighting between Metz and Lorraine; rebuilt by the bishop, it was often attacked and restored in the fourteenth and fifteenth centuries. In 1571 the Cardinal de Guise, bishop of Metz, and the Cardinal de Lorraine assigned it to Lorraine. It was again the scene of frequent fighting between Lorraine and the imperialists, until it was transferred to France by the Treaty of Westphalia (1648).

Marsal, also on a 'briquetage', is named in an inscription

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of the 'Vicani Marosallenses', discovered there and datable to A.D. 44. In 931 it was a possession of the see of Metz, and, though many salt-works were in other hands in the thirteenth century, a bishop of Metz bought them up and let them in 1402 to Lorraine for a rent in salt and money. The 'Coutumes de Marsal', printed in 1627, were very early; the corporation consisted of a provost, nominated by the bishop, and a *maître échevin* with six *échevins* for the administration of justice. The bishops had a mint at Marsal in the fourteenth and fifteenth centuries. During the feud between Metz and Lorraine Marsal was taken and retaken in 1272, 1274, and 1369. In 1552 the French occupied it, in 1555 the Spaniards, in 1589 troops from Metz, and in 1593 Lorraine.

Tarquimpol, on a 'briquetage' forming a peninsula in a salt-marsh east of Dieuze, was important in Roman times, and shows remains of walls with round towers, temples, and amphitheatre. In the fourth century it was named 'Decempagi', corrupted by the thirteenth century to 'Tackenpail'. The donation by Conrad, count of Rixingen, in 1295, of the church to the abbey of Salival was confirmed by the bishop of Metz; this property came eventually to Salm, the rest in 1418 to Lorraine.

Toul

Toul, a Gaulish and Roman site, 'Tullum,' fortified by Valentinian I, was in the part of Lorraine ceded in 919 by Charles the Simple to the Emperor Henry the Fowler, who gave the bishop the rank of count and baron of the Empire. The place had been evangelized by Mansuetus (St. Mansuy), a 'Scot' i.e. from Ireland or Iona. His church was burnt by Clovis, who, under the influence of St. Vaast (Vedastus) of Toul, rebuilt the church, when it was burnt by the Northmen; the Bishops Ludelin and Gozelin built a third church, finished in 922, and burnt by the Hungarians in 927. St. Gozelin's successor, St. Gerard, built a new church in 970–81, and placed there a relic—a nail of the True Cross—still preserved, though the existing church dates from the thirteenth and fourteenth centuries.

In the eleventh and twelfth centuries the townsmen were already in conflict with the bishops, and in 1249 put themselves under Matthew II, duke of Lorraine, revolting from

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Bishop Roger de Marcey, who regained his authority. A conflict with the duke was ended in 1291 by treaty with 'the mayor, *échevins*, and all the universities [guilds] of the citizens of Toul', and the struggle went on between the bishops and the dukes. Bishop Thomas de Bourlémont (died 1353) tried in vain to attach Toul to France. In the fifteenth century Robert, the damoiseau [lord] of Commercy, carried on a long war with Toul. Duke René II of Lorraine tried in vain to capture the rights of the citizens. At last, tired of attacks, and of paying ransom for its freedom, the city offered itself in 1552 to Henry II, king of France.

The bishopric of Toul was united in 1790 to that of Nancy. In the nineteenth century the bishop of Nancy was allowed to call himself 'and of Toul', but Toul was not again a separate see.

Verdun

Verdun, the Roman Verodunum, was destroyed by the barbarians and restored late in the fifth century. It was taken by Clovis, 502, at the time when St. Vitonius (Vanne) was bishop. In 843 the treaty partitioning the Empire of Charlemagne between the three sons of Louis the Pious was signed here, and the Treaty of Meerssen (870) left this district in the hands of Charles the Bald of France. The earliest known count of Verdun and lord of Briey was Ricuin, who died in 923, and was followed by his son Odo and two Rudolfs; then Godfrey of the Ardennes and his descendants held the county. Meanwhile, and probably in 959, when Upper and Lower Lorraine were divided, the county of Verdun was separated from Briey. The latter was held by Frederick of Bar, duke of Upper Lorraine (died 978), and passed to his descendant, the Countess Matilda of Tuscany, celebrated by Dante, and from her again to Bar, with which it remained; and the counts of Bar called themselves viscounts of Verdun and lords of Briey. The county of Verdun was given late in the tenth century to the bishop, and formed his temporal possessions.

The town began to dispute its liberties with the bishop as early as the eleventh century; in the twelfth the burghers had secured a measure of independence.

Verdun was taken, with Metz and Toul, by Henry II of France, 1552, but was not a part of the French kingdom until the Treaty of Westphalia (1648).

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LORRAINE

The Bailliages of Lorraine

Mediaeval Lorraine, as it was after the separation of the three bishoprics and other independent States in the tenth century, consisted of three bailliages: (1) Nancy, (2) the Vosges, and (3) the Bailliage d'Allemagne. To these were added later the Bailliages of (4) Bar, (5) Clermont, and (6) Bassigny.

(1) *Nancy*, early in the eleventh century, was merely the castle of Odelric, brother of Duke Gerard of Alsace. The town around it was walled when the dukes made their chief residence there in 1153. Among places won from Metz and added to the bailliage may be named Château-Salins, a castle built about 1320 to protect the salt-works; it was disputed, with continual fighting, by Metz until 1381. Dieuze, a pre-Roman site and named Diiosa in 1025, was an old royal domain given to a church at Verdun from early times, and held by Lorraine from that church in the thirteenth century.

Lunéville was centre of a county in the tenth century, given by Stephen, bishop of Metz, to his nephew, Wolmar. Wolmar III united this county with other lands of Metz, forming the county of Lunéville-Metz, whose last count about 1220 gave it to Lorraine in exchange for lands in the Vosges. Late in the thirteenth century the town was enfranchised under the Loi de Beaumont.

Vaudémont was an ancient county, formed out of part of the Chaumontois (see pp. 186–7), which came to Lorraine by marriage in 1480. It was held afterwards by junior members of the ducal family as titular counts until the absorption of Lorraine by France.

(2) The *bailliage of the Vosges* originated in the ancestral estates of Gerard on the border of Alsace, north of Montbéliard. Among the towns added to this south-eastern portion of Lorraine are:

Remiremont, a Roman site, later called the castle of Avend, or Habend, belonging in Merovingian times to a Count Romulf, whose son, becoming a monk in the Columban abbey of Luxeuil, founded a double monastery of the Columban type (like Massevaux, p. 171) at the castle. The canonesses became 'countesses' of the Empire under Lorraine, and in 1554 the Emperor Charles V confirmed their privileges and their rights as a free imperial

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town. It still remained under Lorraine, not without periods of revolt, until 1674. One of the abbey's possessions was Plombières, where the hot springs were used as medicinal baths from Roman times; and when in 1292 Duke Ferri III of Lorraine built a castle there, 'to protect the bathers,' the canonesses resented his interference and fought him for three years. A century later a hospital was built for the bathers, in the eighteenth century enlarged by Duke Stanislaus.

St. Dié, a Roman station, where in 661 Deodatus founded an abbey, which in 1115 became a chapter of canons. Here also a town grew up and struggled with the abbey for freedom; after a battle in 1308 the abbey remained dominant and became celebrated as a great centre of learning, where the printing-press from 1494 issued works of the early Renaissance, such as the famous *Cosmographia* of 1507.

Épinal, an abbey founded by the bishop of Metz late in the tenth century, also grew to a town, which in 1289 had partly secured its freedom. In 1444 it invited the protection of Charles VII of France. The bishop of Metz excommunicated and attacked Épinal, which put itself under Lorraine. It continued faithful to the dukes, in spite of sieges by Burgundy and Metz, until its conquest by Louis XIV.

(3) The *bailliage d'Allemagne*, or *pays tudesque*, originated in the stewardship of ancient domains of the ducal family in Westrasia, together with ducal rights, military and judicial, over the lords of the Westrasian States—all under the Empire. This bailliage was apparently in being in the twelfth century. One of the northern places held by Lorraine from 1065 was Sierck, then a castle, but by 1294 a walled city and enfranchised by Duke Ferri III. This charter was renewed by Duke John in 1364, and the dukes had a residence and a mint at Sierck. Under Lorraine the town was held from 1175 by the family of Montclair (Moncler on the Saar), who seem to have sprung from the ducal house. Their territory in 1442 became an imperial county, and their family was highly distinguished, giving bishops to Utrecht, Toul, Trier, and Metz; but late in the fifteenth century its possessions were divided, and the name lost its importance. Sierck remained with Lorraine until it was taken by France in 1643.

On the northern border of Lorraine a number of estates included in French Lorraine in the seventeenth century had

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been originally held by Luxemburg—the county of Roussy (Rüttgen), the lordships of Florange (Flörchingen), Fontoy (Fentsch), Püttlingen, Rodemachern, Rollingen, and many smaller places. The interests of Luxemburg, Metz, and Lorraine met at Volmeringen (on the Nied, between Metz and Saarlouis), where the three powers had a customs-station in the fourteenth century; Lorraine and Metz still divided the lordship in 1682. The most important place formerly in Luxemburg is the town of Thionville (German Diedenhofen), 'Theodonis villa' in 753, a royal domain of Charlemagne and of the kings of Lotharingia, an imperial town in the eleventh century. It was enfranchised by Count Henry of Luxemburg in 1239. Its further history is chequered: in 1441 put under protection of Burgundy, in 1442 to Duke Wilhelm of Saxony, then to Burgundy again, and in 1453 to King Ladislaus of Hungary; his daughter brought it to Charles VII of France, whose son, Louis, sold it to Duke Philip of Burgundy, whence it went to Habsburg and Spain. It was captured by Francis of Guise, 1558, and returned by the Treaty of Le Cateau-Cambrésis to Spain; taken by the Prince of Condé, 1648, and finally assigned by the Treaty of Westphalia to France.

(4) *Bar*, named 'pagus Barrensis' before the building of the castle of Bar-le-Duc about 963, was held in the tenth century by counts who became dukes of Lorraine (see p. 200). The last of these died 1033, leaving two daughters; one of these took part of the allodial domain by marriage to Louis of Pont-à-Mousson (see p. 204), who became count of Bar, and the other gave Briey to her daughter, the Countess Matilda (see p. 200), who left it to Bar. The duchy of Lorraine passed to the house of Alsace, and Bar became a separate county again. The allodial holdings of the county formed the westernmost edge of the Empire; great part of the county lay in France. The son of Louis of Bar, Mousson, and Montbéliard was Theodoric (died 1104), whose daughter, Agnes, brought Langstein to Salm (see p. 187); another daughter carried other property to the count of Mörsberg or Morimont, a lordship in the valley of the Seille. But the county of Bar survived in spite of dismemberment, and when Count Henry III (father-in-law of our Edward I), having been taken prisoner by Philip the Fair, had to recognize the overlordship of France (1301), the distinction was made between French Bar, 'Barrois

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mouvant' (the bailliages of Bar-le-Duc and La Marche), and the imperial part, 'Barrois non mouvant,' which latter was raised to a duchy by Charles IV in 1354.

Duke Edward of Bar fell on the French side at Agincourt, 1415, and the county was held by Louis of Bar, cardinal bishop of Verdun, who gave it to his grand-nephew, René of Anjou. René held it till his death in 1480, when it passed to his grandson, Duke René II, and was permanently united to Lorraine.

The northern outlying part of Bar included the baronies of Viviers, Ottange or Oettingen, Bassompierre or Bettstein, and the Ban de la Rotte (between the French Nied and the German Nied). The history of Bar is closely connected with that of the county (later a marquisate) of Mousson.

Pont-à-Mousson was held, early in the eleventh century, by Louis of Montbéliard, who married one of the daughters of Frederick, duke of Lorraine (see p. 203), and so became count of Bar. Montbéliard became separated, but Mousson remained with Bar. In 1354 the Emperor Charles IV made Mousson a margraviate or marquisate, and it came to Lorraine (like Bar) through René of Anjou.

Commercy, from the ninth century, was independent under the bishops of Metz, and held by lords called *damoiseaux*, one of whom has been mentioned as the troublesome neighbour of Toul. In 1544 it was besieged by Charles IV. Late in the seventeenth century it was the residence of the Cardinal de Retz, from whom it was bought by Charles IV of Lorraine.

(5) *Clermont-en-Argonne* was the part of the central area of Bar held of the Empire, and not, as the rest, from France.

(6) *Bassigny*, of which the bailliage was located at Bourmont on the Meuse, included the south-eastern part of Lorraine, with the town of Neufchâteau, which carried on a war with Charles the Bold of Lorraine from 1391 for twenty years, and was finally assigned to him by the French Crown, of which it was a fief.

The Dukes of Lorraine

Out of these various and confused elements Lorraine succeeded—as Alsace never did—in building up a State which achieved unity and independence. This was owing partly to the external pressure of the Empire, France, and Burgundy, but in a considerable degree to the personality of the remarkable

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dynasty of dukes, who sprang from the ancient Frankish stock of Alsace, and till 1918, as the House of Habsburg-Lorraine, ruled the empire of Austria.

The succession during four mediaeval centuries can be treated shortly: 1048, Gerard of Alsace.—1069, Theodoric 'the Valiant'; *Theodoricus dux Metensis* named in 1105.—1115, Simon.—1139, Matthew.—1176, Simon II.—1205, Frederick or Ferri.—1206, Ferri II.—1213, Thibaut (Theobald), who in 1218 was overcome by the count of Champagne and forced to acknowledge that he held his duchy from that count and not immediately from the Empire.—1220, Matthew II.—1251, Ferri III, who reigned more than fifty years, seeing the rise of the free cities and favouring them as his supporters against the three bishoprics.—1304, Thibaut II.—1312, Ferri IV, who fell in the French cause at the battle of Cassel.—1328, Raoul (Rudolph), killed on the French side at Crécy.—1346, John, who was taken prisoner by the English at Poitiers.—1391, Charles 'the Bold', whose war with Neufchâteau brought him into collision with France under Charles VI. In 1407 he was summoned to appear before the French parliament, and on his refusal was condemned to heavy penalties—some accounts say, to death—but was restored to favour and became constable of France 1418–24; he died in 1431, without male issue.

René of Anjou, who had married Charles the Bold's daughter and heiress, Isabella, assumed the duchy, and tried to strengthen his position by liberal charters to the towns, as well as to the clergy and nobles. His right was challenged by Anthony, count of Vaudémont, Isabella's cousin, on the ground that the duchy could not descend through a female. Anthony defeated René and imprisoned him, but both the Emperor and the king of France supported Isabella; the dispute was settled by the marriage of her daughter, Yolande, with Anthony's son, Ferri.

René II was the son of this marriage; his sister, Margaret of Anjou, was queen of Henry VI of England. In the person of René II Lorraine, Bar, Mousson, and Vaudémont were united under one ruler (1480).

Shortly after his accession in 1473 René II was persuaded by Charles le Téméraire of Burgundy into an alliance which practically made Lorraine a dependency of her ambitious neighbour. Charles had acquired the Sundgau in 1471 by mortgage from Sigismund of Tirol, the Habsburg lord of Upper

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Alsace, and he hoped to create a 'middle kingdom' for himself. like that of Lothaire I. Against him the League of Constance was formed, and René II, repenting his bargain, joined the league and defied Charles, who rapidly conquered Lorraine and seated himself at Nancy. Early in 1476 he left the town for the campaign which ended in his overthrow at Granson. His garrison was driven out of Nancy, and when he returned to besiege the town, René II, with Alsatian and Swiss allies, relieved it. At the battle of Nancy, Jan. 5, 1477, Charles le Téméraire was killed and the power of Burgundy broken. Louis XI annexed the western half of Charles's duchy; the eastern part remained under the Empire; and Lorraine, though obtaining no territory, regained independence.

The family of René II became highly distinguished. The duchy went to his eldest son, Anthony 'the Good': another son, Claude, was made duke of Guise by Francis I, and was father of Francis le Balafré, of Charles, second cardinal de Lorraine, of Louis, cardinal de Guise, and of Mary, the mother of Mary, Queen of Scots. A third son of René was Jean, first cardinal de Lorraine.

Anthony at the Convention of Nuremberg, 1542, denied that he, as duke of Lorraine, owed feudal obligations to the Emperor, asserting that he was the Emperor's vassal for only a few subordinate fiefs. An arrangement was made that he should pay 2*s.* 3*d.* of the usual tax of an elector of the Empire, and receive not only the fiefs he held from the Empire, but also Lorraine, Blâmont, Mousson, and other holdings under the protection of the Empire, and the duchy was declared sovereignly free and independent. To German historians this transaction appears to imply that the duchy of Lorraine was held under the Empire, which French writers deny, considering that the declaration of independence overrode the statement that it was granted by the Emperor. As a matter of fact Lorraine was thenceforward independent of the Empire in all political matters, although the ducal house was then and afterwards closely connected with the Empire by domestic relationships.

The conflict of these political and domestic claims made itself felt on Anthony's death. His daughter-in-law, Christina, was the Emperor's niece. The policy of the State favoured France. On this account the guardianship of the young duke,

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Charles III, was taken from his mother, Isabella, and given to his uncle, Jean, cardinal de Lorraine and bishop of Metz (1546). This was at the time when Metz, mainly Protestant, was offered by the Protestant German princes to France as price of her help against the Empire. The bishop joined the Reformers in throwing open the gates to the French, and Henry II entered Metz on Palm Sunday 1552 (see p. 196). Charles V besieged the town in vain, and by the treaty of Le Cateau-Cambrésis, 1559, Metz, Toul, and Verdun were ceded to France.

The young duke, Charles, afterwards known as 'the Great', was brought up under French influence and married Claude, daughter of King Henry III. He reigned for 64 years, and under him Lorraine prospered, in close connexion with France. His granddaughter and heiress, Nicole, married the representative of the ducal house by male descent, who as Charles IV held the title of duke for 51 years—the lean years of Lorraine, a half-century of disasters following half a century of consolidation and prosperity. Reverses began when the new duke welcomed French exiles and made alliance with his relative, the duke of Bavaria. Louis XIII attacked and overcame him. By the Treaties of Vic and Liverdun (1632) he had to cede nearly all Lorraine to France, and in 1634 he abdicated. Returning after the failure of his brother, Cardinal Nicholas, to reign in his stead, he was again overcome and abdicated again (1648). Restored in 1659, he saw his remaining fortresses dismantled, and in 1662 went to Germany to join the Empire against France. Once more he tried to retrieve his fortunes in Lorraine, but was defeated in battle and capitulated at Trier in 1675, in which year he died.

His nephew, recognized as Duke Charles VI of Lorraine by all powers except France, spent his life in the Austrian army, in which he distinguished himself. He was one of the heroes of the battle of 1683, when the Turks were defeated near Vienna. He married a sister of the Emperor Leopold, and died 1690. His son, Leopold Joseph, accepted the terms offered by Louis XIV, and regained the duchy of Lorraine, but only as a province of France. The position was formally stated at the Peace of Ryswick (1697), when Louis XIV was confirmed in possession of Strasburg and the greater part of Alsace, as well as in the sovereignty of Lorraine.

After Duke Leopold's death in 1729, Francis Stephen, his

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son, entirely Austrian by birth and breeding, and married to Maria Theresa, Empress in succession to her father, the Emperor Charles VI, was clearly no fit person to hold Lorraine as a French province. It was arranged that he should take the duchy of Tuscany, then vacant by the death of the last of the Medici. In 1745 he was elected Emperor as Francis I. He was the father of Marie Antoinette, and from him comes the Habsburg-Lorraine House of Austria.

Louis XV gave the duchy of Lorraine to his father-in-law, Stanislaus Leczinski, ex-king of Poland, who enjoyed it until his death in 1766. Lorraine then lost its last show of independence and became politically a part of France, as it had been in all other respects for two hundred years.

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CHAPTER XI

HISTORY: ALSACE-LORRAINE UNDER FRANCE AND GERMANY

Alsace and Lorraine under the French, 1648–1870

The acquisition by France of the three bishoprics in 1552 and the cession of the greater part of the duchy in 1632 have been already mentioned. In Alsace many of the towns were occupied by the French in 1634; and, though Strasburg was not captured until 1681, and certain minor lordships were nominally independent from 1697 until the Revolution, it may be said that France was dominant in Alsace-Lorraine generally from 1648, the date of the Treaty of Westphalia, which closed the Thirty Years' War.

The course of events in that war, as involving these provinces, may be given in short abstract:

In 1621 Mansfeld, on the Protestant side, but with troops which were a terror to their allies, entered Alsace from the north (where the English under Sir Horace Vere were occupying Spire); he sacked the Catholic towns—Weissenburg, Hagenau, &c.—and wintered at Hagenau. Next year Cordova, lieutenant to the imperialist general Spinola, pressed him back farther into Alsace, which was overrun by the imperialists after the battle of Höchst (in Wiesbaden), June 20, 1622, when Tilly almost destroyed the army of Christian of Brunswick. Mulhouse, being garrisoned by the Protestant Swiss, escaped the worst horrors of war, but the country was eaten up by Tilly's army, which then moved into Lorraine.

In 1631 the Swedes came upon the scene. Strasburg, mainly Protestant, sided with Gustavus Adolphus, but in the later part of 1632, after the battle of Lützen, in which he fell, his field-marshal Horn and Bernard of Saxe-Weimar, commanding Swedish troops, ravaged the country from Hagenau to Ferrette. At the same time, in Lorraine, Duke Charles IV, on the imperialist side, was unsuccessfully fighting Louis XIII, and by

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the Treaties of Vic and Liverdun had to cede nearly all his duchy to France.

In April 1633 the League of Heilbronn was formed between the Swedish chancellor Oxenstjerna, the German Protestants, the French, English, and Dutch, for the more energetic prosecution of the war against the Empire. In Upper Alsace, during this year, the people rose against the Swedes and recaptured Ferrette, Altkirch, and other towns, but were overcome by Bernard, and the district was very severely treated.

At the battle of Nördlingen in Bavaria, Sept. 5–6, 1634, Horn was made prisoner and Bernard wounded; the Swedish army was cut up and its prestige destroyed. This gave Richelieu the opportunity of active interference in Alsace. He took over the towns offered by the Swedes as the price of French assistance, and thenceforward garrisoned them. Fighting went on in Lower Alsace, where Duke Charles IV, who had abdicated the duchy of Lorraine, led an imperialist army. In 1635 he took Gemar, Lützelstein, &c., and it was not until the next year that the French retook Gemar and Bernard recaptured Lützelstein. But the imperialist army under Gallas was now in Lorraine, ravaging the country.

In May 1635 the Treaty of Prague, by which the Emperor Ferdinand II received the help of Saxony, gave an accession of strength to the imperialists; and in 1636 Charles IV recovered his duchy of Lorraine, while Gallas occupied Lower Alsace.

Bernard of Saxe-Weimar still held the Sundgau. It had been arranged with Richelieu that he should eventually be recognized as duke of Alsace. In 1638 he wintered at Bâle, besieging Breisach. He won victories over the Bavarians at Wittenweiler (Aug. 9) and over Charles of Lorraine at Thann (Oct. 15); in December he took Breisach, starved into surrender. But on July 18, 1639, he died, and his army was taken into the French service. Alsace as a whole was thenceforward under the French, and no longer the seat of war, which was transferred to Lorraine.

In 1640 the French took Zabern, and in 1643 completed the conquest of Lorraine by taking Thionville and Sierck. Richelieu had died in 1642 and Louis XIII in 1643; during the minority of Louis XIV the French government was carried on by Cardinal Mazarin, under whom the Treaty of Westphalia, Oct. 24, 1648, was arranged.

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The Treaty of Westphalia gave the Habsburg possessions in Alsace-Lorraine to the French Crown, reserving imperial rights in all cities and lordships holding immediately from the Empire, but 'without prejudice to sovereign rights' accorded to France. That is to say, according to the view held by the German negotiators of the treaty, the French Crown was to hold whatever the Habsburgs had held as feoffees of the Empire, but to hold these possessions as from the Emperor. In the French view it amounted to a cession of territory with all rights thereto belonging, and this as conquered territory —for by this time, and still more by this treaty, the Empire was reduced from its ancient position of paramount secular authority in Christendom to a loose federation of German States both Catholic and Protestant. The rights of the Habsburgs over some of the ceded States were by no means full and clear, as had been found when Sigismund of Tirol mortgaged the Sundgau to Charles of Burgundy. But on the other hand France under Richelieu had formed the idea of a united nationality coextensive with ancient Gaul. In such a kingdom there was no place for independent small States, nor could it be a member of the Empire. Indeed the greater imperial States had no intention of admitting France to a place among themselves, where such a power would have been a preponderant element, and the French king might at any time have become their emperor.

As a matter of fact the French king never took his place at the Diet as a member of the Empire. Three million livres were promised to the Archduke Charles Ferdinand as compensation for his lost landgraviate, and the ministers of Louis XIV tightened their hold on Alsace. Henri de Lorraine, count d'Harcourt, a cousin of Louis, was appointed governor of Hagenau, representing the ancient bailiff of the free towns; but they were slow in accepting the new régime, which destroyed the illusion of their independence. Mulhouse was recognized by the Treaty of Westphalia as free to continue its connexion with Switzerland, but the other towns, following the lead of Colmar, continued to send representatives to the imperial Diet and resisted French innovations. They even sent a contingent to Austria for the Turkish war in 1664, and in 1666 and 1670 Colmar struck coins bearing the eagle and the Emperor's name, and on the reverse its own name, as if still

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a free imperial city. The Treaty of the Pyrenees (1659) ratified the cession of Habsburg rights in the Sundgau, though the indemnity to the archduke had not been paid. But when the Duke de Mazarin, who succeeded his uncle, the cardinal, as governor (in 1661), tried to make the towns swear allegiance to Louis XIV they refused, and the differences broke out into hostilities.

In 1673 French troops occupied Alsace as a revolted province. There was no effective resistance, but on August 28 they entered Colmar and began to throw down the walls. Louis XIV arrived in person two days later, and treated Colmar as a captured city. Next year the town was sacked by the imperialists, who held it until Turenne's victory at Türkheim, Jan. 5, 1675. A section of the burghers still resisted, but the Treaty of Nymwegen (1678), which closed the ' war of Holland ', fixed their fate by stating the Treaty of Westphalia in clearer terms. Louis XIV promised to restore all places not belonging to him by treaty, while the Emperor ceded Weissenburg and Landau—two of the free towns which had not been occupied by the French. As to Colmar, the French Crown encroached considerably on the independence it claimed, but left practically unaltered the internal government by council and the administration of justice. The cities now accepted the oath of allegiance—Colmar alone with reluctance. It is, however, clear that the reluctance was not so much at transference from German to French rule, as at the loss of an independence of which the advantages were merely sentimental. The free towns had never been able to protect themselves ; Austria could not now protect them ; Mulhouse alone maintained its freedom.

The *Parlement* of Metz had been formed in 1633. A *Conseil d'Alsace* was established in 1658 at Ensisheim (and moved in 1698 to Colmar) as a supreme court of justice with the functions of a *parlement*. At Breisach in 1680 and at Metz in 1681 were founded the *Chambres de Réunion*, whose business was to assert the claims of France to such possessions and rights as had not yet been given up. The procedure of the *chambres* was to examine documentary evidence, laying stress on any point that proved a French title, and to cite recalcitrant owners before them. There was no defence except to appeal to the Emperor ; and the appeal was in vain, for his resources were

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exhausted. In this way all the small counties, lordships, and free towns were absorbed into France, and put under the French Crown with a show of legal correctness; but most of these were restored to their relations with the Empire at the Peace of Ryswick, 1697. Long afterwards, in 1886, it was suggested to the German governor that these ordinances of the *Chambres de Réunion* might be re-examined with a view to their reversal; but it is not on such grounds that modern claims can be founded.

Strasburg was still independent. Louis XIV considered its annexation a military necessity, and the Empire did nothing to oppose him. In September 1681 his minister Louvois appeared before the gates with 35,000 men, demanding admission. The town was in no condition to refuse; its Swiss mercenaries had been dismissed, and many of its burghers were absent. Relations with the Emperor Leopold I were strained; there had been recent disagreements about local rights; but a letter was sent to him to the effect that the authorities had been notified by M. de Montclar, the French general, that the chamber at Breisach had adjudged the king 'all Alsace, of which Strasburg is part; if they did not resist and admitted the French king, their ancient rights would be respected; and they did not see how to resist'. Louvois demanded an answer by break of day; the town asked for postponement till noon, in order to consult the people. Louvois refused, and by four o'clock the French marched in. The articles of capitulation (Sept. 30) confirmed the protection of the Protestants, but appropriated the cathedral for Catholic rites. Suits of more than 1,000 livres were to be removed to the jurisdiction of the *Conseil d'Alsace* at Colmar, and all ammunition was to be given up. On Oct. 23 Louis XIV visited Strasburg in person, and received the submission of the city. The Treaty of Ratisbon (Regensburg) in 1684 secured Strasburg to France.

Louis XIV now refortified the important points of his new frontier, entrusting the work to the famous engineer, Vauban. Belfort, Neu Breisach, Strasburg, and Landau were his work, also a place which now comes into notice as the gate of the great road over the Vosges, Pfalzburg (Phalsbourg). Its fortifications resisted all attacks until 1870, when it became famous in the literature of the Franco-German War. Another work of Vauban's was the reservoir known as the Lac du Bâlon or

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Belchensee, to feed the canal to Neu Breisach ; in 1740 its dam burst with disaster to the valley ; Gebweiler was saved only by the resistance its walls offered to the floods.

The Revocation of the Edict of Nantes (1685) was a severe blow to Alsace-Lorraine, where the Protestant influence—though not by any means universal—was strong in certain towns and States. But a counter-reformation had already set in. Selz turned Catholic under pressure from France in the year before the Revocation, and its abbey was given to the bishopric of Strasburg. In Strasburg itself the Protestants had lost their seats in the cathedral chapter, and a Jesuit seminary had been introduced, which became a college in 1685, endowed with the abbey of Selz. Thenceforward the conversion of Protestants and Jews to Catholicism was energetically pushed. At Colmar a Jesuit school was founded, which in 1765 became a royal college under the university of Strasburg. The Revocation, however, was a disaster to many parts. From Metz there was a great exodus of Protestants (13,000–15,000), taking with them much of the prosperity of the city ; but Lorraine as a whole had been Catholic.

At the Treaty of Ryswick (1697) Louis XIV was confirmed in the possession of Strasburg ; but in compensation he ceded to the Emperor Kehl, Freiburg, and Breisach, places east of the Rhine. Moreover, the counties and lordships which had been absorbed into France by the *Chambres de Réunion* were now restored to their position as imperial fiefs, and remained in nominal independence until the Revolution.

During the eighteenth century French *intendants* governed Alsace : Baron Joseph de Montclair (appointed 1679) ; following him in 1713 the counts (afterwards dukes) de Châtillon, and succeeding them the family de Choiseul, who were in office at the Revolution. The parties standing for independence in the towns were merged in the mass of those who accepted French nationality. A law of Sept. 1, 1679, forbade all *seigneurs*, great and small, to imprison, banish, or punish their tenants in purse or person ; there was to be the same justice for all classes. A decree of the Council of Alsace in 1685 made French the language of the law courts, but in practice this was not enforced. In 1698 the *intendant* La Grange wrote that all Alsatians of the better class spoke enough French to be understood. In 1709 the Prussian ambassador reported, ' It is matter of common

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knowledge that the Alsatians are more French than the Parisians.' The advantages of French civilization greatly outweighed the best that Germany had then to offer—at a period when France was the leading nation in the world, and its language and culture were the fashion among educated people even in Germany. All the modern progress of Germany in literature, philosophy, music, science, and the arts of war was made during the two centuries in which Alsace-Lorraine was united to France and sharing French culture. It may be, as German writers contend, that the Alsatians and Lorrainers assimilated that culture imperfectly, and that the peasantry and working classes were little touched by it ; but it remained the local ideal. Throughout this period, to a German, as to Goethe in 1770–1, Alsace was a foreign land. To a Frenchman it was *une province étrangère* up to the Revolution.

French rule, however, gave peace and stability, unknown before, though, as a border country, Alsace-Lorraine could not be untouched in periods of fighting. In the War of the Spanish Succession it was invaded by the imperialists, who in 1705–6 occupied Hagenau and fought the French at Weissenburg. In 1744, in the War of the Austrian Succession, they invaded again, and the half-savage Pandours sacked Zabern on the highway between Strasburg and Lorraine. But there was not the continual state of unrest which had marked the whole history up to the French conquest.

The difficulties of the eighteenth century were of a new type —not, as German writers suggest, a result of French oppression, but those common to all countries in which the remains of feudalism were still hampering the rise of industrialism. They were partly owing indeed to the ' self-determination ' of the petty States which had returned to the Empire ; the artificial boundaries perpetuated the distinction between these provinces and the kingdom at large, and gave a reason for placing customs barriers between them. Throughout France fiscal difficulties existed, but they were accentuated in Alsace. Taxation bore heavily on the industrial and agricultural workers : the complicated *tailles* and *aides*, the monopoly of salt (*gabelle*), the customs (*traites*), the *capitation*, enforced from 1695 to 1698 and again from 1701, and the *dixième*, introduced 1710, and reduced under Louis XV to the *vingtième*—all collected by the irresponsible farmers of taxes, and oppressive

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to those who were not exempt by right of nobility or clergy. The seigniorial imposts—tolls, market dues, local monopolies like the communal bakehouse, and exactions arising from feudal tenure and falling due at irregular intervals—added to the burden. But these were difficulties common to the age, in which the beginnings of modern industrial conditions had to contend everywhere with the relics of mediaeval life. In Alsace, where comparative peace and freedom together with natural advantages stimulated industry, the clash of interests was violent, and a people whose traditions were those of independence and democracy found the conditions intolerable. In no part of France was the Revolution more welcome. Arthur Young, the English agricultural economist, describes in his journal of travels in France the excitement he witnessed at Strasburg and elsewhere in July, 1789. It was at Strasburg, in the house of the mayor Dietrich, that Rouget de l'Isle composed and first sang the *Marseillaise*. Alsatians were the most eager volunteers, providing some of the best troops and most famous generals of the Republic. The Revolution gave Alsace whole-heartedly to France, a united people, separated definitely from Germany. Even Mulhouse, long aloof, forsook the Swiss and joined the Republic in 1798.

Lorraine, less democratic, and in those days not the industrial country it has since become, was moving in the same direction. In 1787 the sovereign court at Nancy was made into a *parlement* for the province. The nobles protested, but the end of their régime was near. In 1789 the *cahier* presented by Lorraine to the National Assembly demanded the regular convention of provincial estates, self-taxation, equal assessment, abolition of privilege, personal security, suppression of *lettres de cachet*, freedom of the press, admission of the *tiers état* to all offices, reform in justice and education, freedom in communications and industry, abolition of internal taxation—in short, all the general aims of the Revolution at that stage. The nobles of the petty independencies in Lorraine and Alsace protested against the loss of their ancient rights ; but in 1790 the Feudal Committee of the Constituent Assembly reported that the union of France with Alsace rested on the decision of the people, which they took to be unanimous. Mirabeau, in the Assembly, held that such a declaration would mean war, and persuaded the Government to offer indemnities to the feoffees of the Empire

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in exchange for their lordships. Most of the princes declined the compromise and took their case to the imperial diet. Nevertheless, in February 1793, the fiefs were incorporated into the Republic : the duchies of Lorraine and Bar, with the three bishoprics, were redistributed as the departments of the Meurthe, Meuse, Vosges, and Moselle, and the whole of Alsace into those of Haut-Rhin and Bas-Rhin.

War broke out, and Lorraine was first invaded. The Prussians took Longwy and invested Verdun. On September 20, 1792, the victory of Dumouriez at Valmy turned the tide. Alsace was next overrun by the Prussians and the Austrians ; French *émigrés* under Condé occupied Hagenau. General Hoche retook Weissenburg and cleared out the invaders of 1793. The Peace of Bâle (1795) ratified the French conquest of the territories west of the Rhine, and the treaties of Lunéville (1801) and of Amiens (1802) left them in possession.

Napoleon Bonaparte, proclaimed Emperor of the French in 1804, now carried out his plan of an empire to replace the dominion of Charlemagne. The Holy Roman Empire, as represented by Austria, had long been ineffective ; after Austerlitz (1805) Napoleon was the master of middle Europe. By the Peace of Pressburg (Jan. 1, 1806) the power of Austria was still more reduced ; the Confederation of the Rhine had removed from its suzerainty all the western half of the old Empire, and it now lost Venice and Tirol. On August 6, 1806, Francis II formally renounced the title and functions of Holy Roman Emperor and became ' Francis I, Emperor of Austria ', so putting an end to all claims upon the States of Alsace-Lorraine. And when, on Napoleon's fall, the allied powers of Austria, Russia, Prussia, and Great Britain rearranged Europe at the Congress of Vienna (1814–15), the Holy Roman Empire was not restored, nor were Alsace and Lorraine demanded back from France. Even after the ' Hundred Days ' and the battle of Waterloo, though the Allies had been in occupation of the provinces, there was no question of their return to Germany.

Together with the rest of France, Republican Alsace and Napoleonic Lorraine shared in the discontent and unrest of the Restoration. But political troubles died down before the general betterment of life under industrial conditions. The provinces continued to develop along French lines, still taking no part in the growth of German nationality. It is not difficult for German

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writers to show that in many respects trade and manufacture, the education and status of the peasant and workman did not reach, under French rule up to 1870, the level now demanded, and that the French Government made occasional and unsuccessful efforts to spread a knowledge of the French language among the speakers of a venerable but uncouth dialect. But these shortcomings were not special to France ; they are found in the domestic history of all countries in the struggles of the mid-nineteenth century. Industries and agriculture prospered ; the individual was more secure than in most parts of the world ; and the fact that Alsatians and Lorrainers were contented with their lot is proved by the spontaneous resistance they offered to the German invasion of 1870.

Alsace-Lorraine as German 'Reichsland', 1870–1914

In the war of 1870–1 Alsace-Lorraine suffered heavily. Most of the great battles were fought within its borders ; Strasburg and other towns were besieged and taken after periods of acute distress, and they were subjected on capture to severe exactions. The government was at once assumed by the Germans ; the towns were garrisoned by *Landwehr*, and requisitions were made on a large scale—the demands paid, not in cash, but in cheques to be met after the war by the losers. The population offered every form of resistance, by no means welcoming the Germans as liberators.

At the beginning of 1871 the German victory was assured, although a few places still held out when Bismarck and Jules Favre in January began to discuss terms. Louis Thiers, elected French President February 17, arranged the preliminaries in February at Versailles. Alsace and part of Lorraine were demanded by Germany. Thiers tried at first to retain Metz and Belfort, for Metz was admitted by all to be thoroughly French in character, and Belfort had not surrendered before the general armistice of Feb. 15.

When the negotiations were brought before the French National Assembly at Bordeaux (Feb. 17), a strong protest against the cession of Alsace-Lorraine was made by Émile Keller, senior deputy for the Haut-Rhin, and by Jules Grosjean, representing the Bas-Rhin. Belfort was given up by Bismarck on Feb. 23, but the German military authorities stood firm

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in their claim on Metz, and the preliminaries were signed on Feb. 26. The Assembly accepted, on March 1, the arrangements, as far as they had gone.

In May the discussion was resumed at Frankfort. The French asked for more territory around Belfort. This was granted in return for a strip of land 10 kilometres wide along the Luxemburg frontier, giving France 27,000 inhabitants and 6,000 hectares of land in Upper Alsace, in exchange for 7,000 inhabitants and 10,000 hectares on the plateau of Briey. Thiers, whose geography was weak—he had thought at Versailles that Rouen was on the left bank of the Seine (*Memoirs of Hohenlohe*, ii. 52), and that the Uhlans were a savage race (*ibid.* 26)—perhaps did not perceive that he was bartering away the remaining piece of France's mineral fields of which the Germans thus acquired all that was then known as workable.

The Treaty of Frankfort (May 10, 1871) gave to Germany the whole of Alsace (except Belfort and Delle, with some 50,000 inhabitants) and the north-east of Lorraine, the boundary starting from the Luxemburg frontier between Hassigny and Redingen and following an artificial line—not defined by natural features—which leaves on the German side of the frontier Aumetz, Bollingen, Fentsch, Neunhausen, Moyeuvre, Ste. Marie-aux-Chênes, Vernéville, Vionville, Gorze, and Novéant; crosses the Moselle at Arnaville; leaves to Germany Arry, Mardigny, Cheminot, St. Jure, Craincourt, Aulnois, Manhoué, Bioncourt, Burthecourt, Xanrey, Moncourt, Lagarde, Avricourt, Poulcrey, Hattigny, Lascomborn, and so to the ridge of the Vosges. In other words, it assigned the industrial and mineral districts of Alsace-Lorraine to Germany, including a considerable portion of territory inhabited by French-speakers (see map of *Languages*).

To clear the country of the chief sources of discontent the population was given the choice of nationality; those opting for France were allowed 15 months in which to make their arrangements for exile. German official accounts state that 160,000 voted for French nationality, and of these only 50,000 left the country (with their families) by Oct. 1, 1872. Some of the *émigrés* settled in Nancy, Belfort, Bâle, and other neighbouring towns; some in more distant parts of France, as, for example, at Elbœuf in Normandy, where there was

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a Lutheran church for emigrants from Bischweiler, which in 1869 had 11,500 inhabitants, and in 1874 only 7,700; others were provided by a committee under the Comte d'Haussonville with lands in Algeria.

Those who opted for France, but did not emigrate, claimed for a time the rights of foreigners, such as freedom from military service in the German army. But their claims were not allowed, and there was frequent expulsion and emigration after Oct. 1, 1872. Of 112,000 men liable for service in 1871–4 it is said that only 28,000 presented themselves, and that of these 18,000 were physically deficient. The country lost some men of note: among those expelled in 1872 was Auguste Sabatier, professor in the Protestant faculty at Strasburg, and celebrated as a writer of theology and history. His brother, Paul Sabatier, was subsequently Protestant vicar of St. Nicholas, Strasburg; but in 1889, being offered preferment on condition of his becoming a German and declining, he was expelled. The total population lost to Alsace-Lorraine through expulsion and emigration by 1905 has been estimated by a German authority (Hans Witte, *Deutsche Erde*, viii) at about half a million. It is now reckoned that 638,000 have left the country since 1871, not counting further depletions in the course of the present war (see pp. 237–241).

Alsace-Lorraine was constituted a *Reichsland* or possession of the German Empire. The bill for its incorporation was introduced into the German parliament (*Reichstag*) in May and became law on June 9, 1871. It provided that the two provinces were to be vested in the emperor and federal council (*Bundesrat*) until Jan. 1, 1874, the emperor to have sole right of initiating legislation, with the assent of the Bundesrat, and in a few cases that of the Reichstag. Karl Marx said that the annexation was the greatest misfortune that could happen to Germany—it would throw France into the arms of Russia. On Sept. 5 the Labour Congress at Eisenach and on Nov. 24, in the Reichstag, Bebel and Liebknecht protested against the annexation.

The Reichsland was divided, for administration, into three provinces (*Bezirke*), Upper and Lower Alsace and Lorraine. The whole was placed under a supreme president (*Oberpräsident*) at Strasburg, with clauses to give him dictatorial powers in case of emergency (the *Diktaturparagraphen*), although his

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government was to be carried on, in ordinary times, in touch with a special department in the Berlin chancellery under Bismarck. The first president was Eduard von Möller (1874–80), who had been in the Prussian judicial service, from 1866 to 1871 governor of the new province of Hesse-Nassau, which he had organized on new lines without arousing the animosity of the population. But the conditions in Alsace-Lorraine were different from those of a purely German State.

In the belief that the population would acquiesce in the new order, measures were taken which the Germans regarded as favours to the annexed districts. Among such, war losses were paid out of the French indemnity, postal and railway services were remodelled, the tobacco monopoly relaxed, and a new university was founded at Strasburg, May 1, 1872. Compulsory education on the German model had already been introduced, and had met with opposition from the clerical party, whose Catholic schools were superseded. The new Prussian officials and the new measures were resisted by the inhabitants, especially by the 'Alsatian League'. The town councils of Strasburg, Metz, and Colmar showed themselves recalcitrant, and in 1873 were suspended. At the election in August, 1873, out of 22 district councils (*Kreistagen*) only 14, and of three provincial councils (*Bezirkstagen*) only one, formed effective quorums, and many members refused the oath of allegiance to the emperor.

On Feb. 1, 1874, the first election of 15 deputies to the parliament of the German Empire (*Reichstag*) was made. Alsace-Lorraine returned ten Clerical (Ultramontane) and five Liberal or Nationalist members. On their entrance into the Reichstag they made a formal protest against the annexation, demanded a *plébiscite* for self-determination, and retired without further share in the proceedings, gaining the name of 'Protesters'. In this year Klein and Schneegans founded the *Alsace Journal* to advocate autonomy; Bismarck was not unwilling to make some concessions to this demand.

With the beginning of 1874 the first stage of German government lapsed; provincial and district councils were superseded by a committee (*Landesausschuss*) formed on Oct. 29 of ten remaining members of the provincial councils, who met in 1875 to discuss the budget and other local matters.

Imperial orders of 1876 and 1877 gave the *Landesausschuss*

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more liberty; favoured by this, the 'Autonomist' party was formed as an opposition working for self-government and for the raising of the Reichsland to the rank of a free State like other members of the German Empire. At the election for the Reichstag in 1877 the Autonomists won all the five seats allotted to Lower Alsace; and the feeling of the people was so far recognized that on July 4, 1879, a decree was issued giving a constitution to Alsace-Lorraine.

The government of 1879 was presided over by a governor (*Statthalter*) resident at Strasburg, and independent of the Imperial Chancellor; he was to represent the emperor, and to hold, when emergency required, the powers of dictator. Under him the administration was divided into four departments:

(1) The Ministry of the Interior, headed by a Secretary of State, under whom were three presidents of provinces (*Bezirkspräsidenten*)—at Colmar, Strasburg, and Metz. These provinces were divided into 21 districts (*Kreise*), replacing the French *arrondissements*, and subdivided into *cantons*. The provincial councils were chosen, one member from each *canton*, by the vote of men, not necessarily natives, of 25 years old and upwards, subjects of the Empire and paying direct taxes.

(2) The Ministry of Justice and Public Worship, administering the bishoprics of Strasburg and Metz, the consistories of the Augsburg Confession, the Reformed Church, and the Jews; and in judicial matters, the Supreme Court at Colmar, six provincial courts, and 77 local courts.

(3) The Ministry of Finance, Commerce, and Domain Lands, with direction at Strasburg, seven head offices for customs, five for taxes.

(4) The Ministry of Agriculture and Public Works, controlling canals, roads, and mines (railways remained the property of the Empire), with a Chamber of Agriculture, chosen partly by the Statthalter and partly by local agricultural boards.

The presidents of the last three departments were the Under-Secretaries of State.

The Council of State (*Staatsrat*) included these four secretaries with the supreme councillor for education and the president of the high court of justice, as well as 8 to 12 persons nominated by the emperor for a term of three years.

The *Landesausschuss* was enlarged to 58 members, elected for three years. Thirty-four of their number were appointed

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by the provincial councils (*Bezirkstage*) from their members; four by the towns of Strasburg, Mülhausen, Metz, and Colmar; and 20 by the rural districts (*Landkreise*). They were empowered to discuss and to make local laws subject to the sanction of the Bundesrat, and to receive and present petitions to the ministry. They had to take the oath of allegiance to the emperor, who could adjourn or dissolve this body and the provincial councils. After dissolution the election of new provincial councils was to follow within three months, and a new *Landesausschuss* was to be elected within six months.

The first Statthalter was the Prussian field-marshal, Edwin von Manteuffel, who had successfully commanded German armies in the war of 1870–1. Though Prussian and a soldier, he is thought by Germans to have ruled with too light a hand, reversing the policy of von Möller, trying to conciliate individual Alsatian leaders, and attempting government in accordance with the spirit of the people. Towards the end of his administration (1879–85) some steps were taken to repress French tendencies: French insurance agencies were closed, and the use of French in the *Landesausschuss* was forbidden; optants for France were expelled. The anti-German party was weakened for a time; at the Reichstag elections of 1881 and 1884 the Autonomists were beaten, and no longer formed a separate party, as such, in the Reichstag: but they disappeared only to be replaced by Protesters, who in 1881 took 133,000 out of 166,000 votes.

When Manteuffel died (June 17, 1885) he was succeeded as Statthalter by Prince Chlodowig von Hohenlohe-Schillingsfürst (born 1819), a Bavarian and a diplomat, German ambassador at Paris since 1874, and in 1894 promoted to the high office of Imperial Chancellor in succession to Bismarck and Caprivi.

No more competent man could have been appointed to the difficult task of germanizing Alsace-Lorraine, and the difficulty was recognized. Shortly before he took up his work at Strasburg he conversed with the old emperor, William I, on the subject; the emperor said that the same difficulty had been found in the Rhenish provinces in 1839, and had disappeared only when the Rhinelanders had faced the foe with other Prussian troops (*Memoirs of Prince Hohenlohe*, July 25, 1885). It was thought that the Alsace-Lorrainers would gradually accept German nationality when they were offered advantages

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so obvious to German eyes, and guarded from the machinations of the French. At all times in the last 47 years it has been the German belief that the inhabitants remaining in Alsace-Lorraine were amenable enough, but that they were being continually stirred up by French agitation.

On Nov. 5, 1885, Hohenlohe arrived in Strasburg and was welcomed by the German University; the Prussian military did not receive the civilian and Bavarian governor with great friendliness, and throughout his career he found himself somewhat in opposition to them. On his staff von Hoffmann was Secretary of State, von Puttkamer and von Mayr Under-Secretaries; General von Henduck was lieutenant-general of the province. It was noted by the new Statthalter—and these details indicate the position with singular vividness—that, though the ceremonials of welcome had been organized by German new-comers, some native Alsatians also took part in the procession, and the population, while holding aloof, made no counter-demonstrations. He then went to Metz, where he was pleased to hear the French landlord's daughter at the Hôtel de l'Europe repeat a German address, learnt by heart, 'quite nicely'; and at the dinner to the chief people of the town he proposed the health of the emperor, which Manteuffel had always omitted out of respect for the feelings of the French.

Hohenlohe's attitude was that of conciliation, within the limits laid down for him. 'The best programme is a good administration' he said to the provincial council on Jan. 30, 1886. At the suggestion of Baron Zorn von Bulach, one of the few Alsatians who had accepted the new régime and worked for a compromise, he revived the municipal council of Strasburg, which had been suspended in 1873 and dissolved in 1874. He was doubtful about the expulsion of French reserve officers domiciled in the Reichsland, fearing reprisals on the many German reserve officers living in France; but, though himself a Catholic, he was strongly against the admission of Jesuits into Alsace-Lorraine, for it would add to the anti-German element already strongest among the young, the women, and the clergy. The visit of the Emperor William I and the Crown Prince Frederick at the manœuvres held in Alsace (Sept. 1886) passed without adverse incident, and in October Maxime Ducamp told Hohenlohe that people had been anxious when he came to Strasburg, but that they were now reassured;

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indeed, the French were at last talking of giving up the attempt to recover the provinces.

But late in 1886 there was a recrudescence of French nationalism, in connexion with the movement in favour of General Boulanger. The reconquest of Alsace-Lorraine was openly advocated. Relations between England and Russia were strained, and it was thought in Germany that a general European war might break out in 1888. Before that, French forces might be concentrated on the frontier, and German mobilization might be necessary. To prepare for such an event, Bismarck and Hohenlohe agreed on the expulsion of French officers from Alsace-Lorraine, but Hohenlohe was reluctant to introduce compulsory passports for all travellers from France into his provinces, as Bismarck proposed in January 1887, because of the delay and irritation it would cause to businessmen; and the development of commerce in his provinces was felt by him to be a great means of conciliation. Speaking to the Provincial Board on Feb. 9, he expressed a hope that the election to the Reichstag would show a more friendly feeling to Germany (i.e. support the increase of the army), in which case, he said, the Empire would no longer have any reason to withhold equality of rights from Alsace-Lorraine. But the elections (Feb. 22) went entirely against Germany: fifteen Protesters were returned; one of them, Kablé, elected, though in exile, for Strasburg, was a prominent anti-German, and another, Antoine, the deputy for Metz, was subsequently expelled from the Reichstag. The clergy was still Francophil, and when the public prosecutor made house-to-house visitations and seized evidence of membership of the Alsatian Patriotic League Bismarck complained to Hohenlohe that all this ought to have been done earlier and with less éclat, and the comparatively mild rule of the Statthalter was imperilled. A repartition of the Reichsland was proposed at Berlin, giving Upper and Lower Alsace to Bavaria and Baden, and Lorraine to Prussia (March, 1887); but the Emperor William I was against this partition and the abolition of the Statthalter, 'merely because the elections had turned out badly'. He sanctioned a series of proposals, accepted by Hohenlohe, and intended to secure Alsace-Lorraine to Germany without destroying the individuality of the provinces. These proposals were: the dissolution of Francophil associations (choral, sport,

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and 'souvenir' societies); more stringent conditions of residence in the case of French subjects; expulsion of agitators; a stricter passport system; the introduction of political police; abolition of the right of local councils to appoint burgomasters; redistribution of local districts; suppression of anti-German newspapers and exclusion of French papers; prohibition of the holding of shooting tenancies by foreigners (who might be, and Bismarck said always were, spies); and as to the question of the clergy and education, Bismarck was 'to use his good offices in Rome'.

Following upon this increased stringency of German government, a series of incidents took place, embittering relations. On April 20, 1887, the French commissioner of frontier police, Schnäbele, was arrested on the frontier near Pagny, which nearly led to war. On July 18 four Alsatians, members of the Patriotic League, were condemned by the imperial high court at Leipzig for making preparations for high treason. On July 21 the Protesters refused to vote at the by-election at Strasburg for the Reichstag (on the death of Kablé); the German candidate was elected, but the situation was complicated by the rise of a new party, the Old-German 'Separatists', formed of German immigrants who refused to act with the Government and worked against reconciliation with the natives. Hohenlohe's position, as mediator between these opposing elements, was difficult; but on Oct. 27 he was still hopeful. He thought then that the prestige of the Government would not be endangered if 'a few old gentlemen who speak no German, or speak it badly, prefer to conduct the business of their councils in French'. He admitted the set-back at the elections; the feeling aroused by house-to-house visitations, expulsions, and the Schnäbele case; and regarded it 'as a duty of self-preservation to provide no fresh material for these attacks'.

On March 9, 1888, the Emperor William I died. Bismarck pressed for the introduction of compulsory passports against France. Hohenlohe refused for fear of a revolt and the breakdown of the civil government, which would necessitate a state of siege, desired by the military and the immigrant German party, always in opposition to the Statthalter. Bismarck's reasons for the measure were founded on his fear of a general war, which seemed more imminent than ever; it was believed that France and Russia were on the point of attacking Italy, and

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that they were withheld only by the action of the British Government. On May 17 Hohenlohe was compelled to withdraw his opposition, and passports *visés* by the German ambassador at Paris were made compulsory for French travellers entering Alsace-Lorraine.

In June 1888 Hohenlohe asked the Emperor William II, who had come to the throne on the death of the Emperor Frederick, June 15, for a proclamation to Alsace-Lorraine promising milder measures; the request was repeated in January 1889, but in both cases it met with no reply. At the last date French national feeling was at its height, and, though Boulanger fled the country in April, and was personally discredited, war with France was still expected in Berlin. The French army was believed to be better prepared than the German, and Hohenlohe thought that the constant 'nagging' on the part of the Germans was exasperating their neighbours. 'Not the annexation of Alsace-Lorraine,' he said, 'but wounded national pride was driving the French into war.' Bismarck, however, still held to his policy of keeping everything French out of the Reichsland, and Hohenlohe could only point to such works as the new reservoir at Alfeld (in the Vosges; see p. 92), and the promise of the Ludwigshafen canal, as evidences of German goodwill. That he had made a slight progress was shown by the return in 1890 of three (out of fifteen) Reichstag members favourable to Germany; but the resistance of the people had changed its form from useless protest to constructive aims toward self-government—a revival of the Autonomist policy.

Bismarck resigned the Chancellorship on March 20, 1890, and was succeeded by Caprivi. The Emperor William II thought it desirable to encourage Germans to buy property in Alsace-Lorraine. Hohenlohe was still pressing the need of canals to promote the commerce of his provinces; but the Prussian finance minister, Miguel, objected to all facilitation of communication with France, and as to the promised Strasburg–Ludwigshafen canal he said that it was opposed by Baden and Bavaria. These practical measures therefore failed. Early in 1891 the Strasburg government proposed a redistribution of the district courts of Alsace, but the provincial council rejected the measure, and in February occurred the outburst of animosity in Paris on the occasion of the Empress Frederick's visit, and the refusal of French artists to contribute to the

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Berlin Exhibition. In consequence of this hostile feeling the passport regulations were made more stringent. A deputation of Alsatians to Berlin, charged with remonstrance, met with little sympathy, and in fact were told by the Secretary of State, von Marschall, that Berlin did not care whether the inhabitants of the Reichsland were satisfied or not, for the country would be the battlefield of the expected war.

The situation for Alsace-Lorraine was more strained than ever, but milder counsels prevailed. On Sept. 21, 1891, the compulsory passports were abolished except in the case of military men and emigrants; and in December Hohenlohe got his way to some extent about the canals—for Caprivi agreed to the deepening of existing watercourses if the provincial council voted for it.

In 1892 matters were a little easier, and the Reichstag elections of 1893 were slightly more favourable to Germany, but the Clerical opposition remained. In June 1893 the Government dissolved the Catholic association *Fedeltà*; the Catholics protested to Feichter, chief of the police, and were met with remonstrances about their behaviour at the Reichstag election. This was taken as an insult; the subject was raised in the Reichstag and referred to the emperor, who was unwilling to dismiss so zealous an official. And when Prince Hohenlohe was called to the Imperial Chancellery in succession to Caprivi (October 1894) the friction between the people of Alsace-Lorraine and the German Government had by no means been smoothed away.

The next Statthalter (Dec. 1, 1894) was Prince Hermann zu Hohenlohe-Langenburg, Count von Gleichen, formerly in the Austrian military service, and a general in the war of 1870–1. Under him, in 1895, the tax on buildings was reduced and the door and window tax abolished; a new code of provincial law was introduced and new regulations relating to the press, answering to the press-laws in force throughout the Empire. Section 10 of the imperial decree of Dec. 30, 1871, empowering the governor to take steps for public safety and to call in the military for that purpose (the *Diktaturparagraphen*) had been long felt to be a grievance; and the Reichstag had proposed its abolition: it was now removed, at the instance of the emperor (May 9, 1902).

The victory of the Liberals over the Clericals in the elections

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for the district councils in June 1902 and the affiliation of the local trade unions with those of Germany seemed to join Alsace-Lorraine more closely with the general political conditions of the Empire. In December 1902 the first Social Democrat, elected by Mülhausen, entered the *Landesausschuss*. To counteract the French Clerical opposition a compromise was arranged with Rome as to the foundation of a faculty of Catholic theology in the University of Strasburg (Dec. 20, 1902). At the elections for the Reichstag, June 1903, parties in Alsace-Lorraine stood for the first time as elsewhere in Germany, showing no peculiar local tendencies. The Socialists took about a quarter of the votes, and the Clericals were in line with the 'Centrum', with which the Imperial Government was anxious to stand well—the more so as the French Government was then at open war with the Clerical party in France. It was part of the programme of the Reichsland Clericals to work for autonomy, to which the Bundesrat did not yet assent; but the movement was not without effect.

The census of 1905 showed a decrease in the inhabitants using French as their mother-tongue. In 1907 Alsace returned eight 'Centrum' and two Socialists; in Lorraine one 'Centrum' candidate was successful. Germany hoped that the Reichsland was at last taking its place in the Empire after thirty-five years of struggle.

In October 1907 Count von Wedel, formerly ambassador at Vienna, took up the government as Statthalter; and in October 1908 the Alsatian Baron Zorn von Bulach became Secretary of State. It was thought that Prince Hermann Hohenlohe had left matters too much to his Secretary of State (von Köller), who was considered an opportunist and subservient to the Clerical majority in the *Landesausschuss*. When the new Secretary, though himself an Alsatian and a Catholic, tried to carry out the new Statthalter's measures in opposition to the growing tendency towards French interests, he was met with a new outburst of resistance.

In 1907 the Alsatian clergyman Spieser had raised a cry of warning against the recrudescence of a Francophil movement, and attention was drawn to the danger to Germany. The Germans claimed that the true French-speakers, to whom French was the mother-language, were a very small minority; in all Alsace only 11 per cent. But they were active, and the

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situation was complicated by international difficulties which at the time had become acute. The number of French newspapers in Alsace increased. Enlistments in the French Foreign Legion rose rapidly from 316 in 1906, 572 in 1907, and 939 in 1908 to 1,022 in 1909. The toleration of the *Souvenir français*, for keeping up the graves of French soldiers fallen in the war of 1870–1, resulted in the great anti-German demonstrations at Noisseville (near Metz) in Oct. 1908, when 100,000 persons attended a Francophil meeting, and at Weissenburg in Oct. 1909, when the *Marseillaise* was sung at the unveiling of the statue of *La Gloire*. The *Revue alsacienne illustrée*, founded in 1899, now began to publish articles by French writers. A *Société dramatique de Strasbourg* and a *Cercle des amis et des lecteurs des annales politiques et littéraires* were formed. The exhibition at Nancy, opened in the summer of 1909, representing eastern France, appealed strongly to Alsace.

In the *Landesausschuss* these movements were reflected by a proposal to introduce French teachers for the last four years of courses in schools; this was evaded by the Government. Several prosecutions resulted from the agitation; the Abbé Wetterlé of Colmar, a clergyman and journalist, member of the Reichstag and of the *Landesausschuss*, was sentenced to two months' imprisonment for libel. By the spring of 1910 the anti-German elements had combined into a still more powerful Nationalist party, in face of which the reforms intended at Berlin to pacify the country seemed to be useless. These reforms, meant to offer a fuller representation of the people in the *Landesausschuss* and to improve the relations of the Reichsland with the German confederacy—in short, to reorganize the constitution on the lines subsequently adopted—were deferred; but the Government congratulated themselves on various signs that their policy was bearing fruit. A German League of Alsace-Lorraine, supported by incomers from 'Old Germany' and some Alsatians, was working to counteract Francophil propaganda. The art world appeared to be united in the 'Association of Art-lovers of the Rhine', and the 'German Teachers' Association' (founded at Whitsuntide, 1910) brought together the majority of educationists. Clerical influence opposed these associations and resulted in a struggle between the Government and the bishops of Metz and Strasburg in 1910. In German Lorraine there was trouble with the

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clergy over the burial of Protestant new-comers in parishes hitherto purely Catholic.

So for forty years the struggle went on, and Alsace-Lorraine was still unreconciled. The aims of the people had certainly undergone a change. Reunion with France appeared impossible without a war, and the most ardent nationalists shrank from paying such a price. It was generally felt that, short of redintegration with France, or complete independence as a minor State (which would have been the ideal of a section), the requirements would be satisfied with autonomy within the German Empire—such self-government as was enjoyed by other States.

These aims were not unrecognized at Berlin, and they were no doubt intended to be embodied in the new constitution granted on May 16, 1911. Under a Statthalter, appointed by the emperor, Alsace-Lorraine was given a parliament (*Landtag*) in bicameral form. The upper house was to consist of the bishops of Strasburg and Metz; the president of the upper consistory of the Churches of the Augsburg Confession; the president of the synod of the Reformed Church; the president of the high court at Colmar; a representative of the University of Strasburg, elected by the whole university, from the professors; a representative of the Hebrew Consistory; one of each of the cities of Strasburg, Metz, Colmar, and Mülhausen, elected by the common councils; one of each of the Chambers of Commerce of these four cities; two of the commission of agriculture, and two of the industrial guilds at Strasburg. To these were added an equal number (or not more than their number) of persons appointed by the emperor on the nomination of the Bundesrat. The lower house was to consist of 60 deputies elected for five years by male suffrage under the ballot. Fifteen members, elected as before, were still to be sent to the Reichstag. Three delegates, nominated and instructed by the Statthalter, were to sit in the Bundesrat, but without votes in important questions in which they might be supposed to be under Prussian influence, and therefore opposed to the interests of the other German States. Finally, German was made the language of administration and education, though French was permitted at public meetings, and in certain districts in schools and local administration.

Only one Alsace-Lorraine deputy voted in the Reichstag

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for this new constitution, which was felt to give the show of autonomy without its substance. The provinces were not yet placed on an equal footing with the States of the Empire. Nor was the arrangement satisfactory to the Imperial Government; for when the Landtag protested against the order for the expulsion of a director of locomotive works, who was alleged to be French in his sympathies, the emperor replied (May 1912) that unless there was a change he might suppress the constitution and incorporate Alsace-Lorraine with Prussia. But still the Landtag was recalcitrant.

In 1913 occurred the conflict between the military and civilians at Zabern, accentuating all the old animosities. The Reichstag passed a vote of censure on the Government, but the offending officers were ultimately acquitted. One of them said that a German army in Alsace was practically in an enemy country.

One German view on the question as it now stands has been put with great clearness and cleverness by Hermann Wendel,[1] himself not an Alsatian or Lorrainer, though he spent his schooldays at Metz, but an editor at Frankfurt-a.-M. and member of the Reichstag (1912) for Freiberg in Saxony. He writes his pamphlet (*Vorwärts* Office, Berlin, 1916) from the point of view of the Social Democratic party, which in Germany had thrown in its lot with the Government in the war. Brushing aside ancient history, he claims that the population of Alsace-Lorraine was always mainly German; the French element has been only a provincial *bourgeoisie* with a little French polish, who until recently have exploited the peasant and workman, withheld education and political rights from them, and now need no sympathy. With the emergence of the working and peasant classes, the ideals of democracy have emerged, and the German Social Democrat has always been the friend of Alsace-Lorraine, as the latter now is heard to admit. The French Social Democrats on the other hand have never ceased from stirring up disaffection contrary to the true interests of the country. These true interests are economic

[1] It should be noted, however, that Wendel himself in 1917 headed a public agitation against the present reign of terror in Alsace-Lorraine, asserting that it had destroyed all good feeling for Germany and had entirely alienated the population. The fact seems to be that Wendel, like many others, has been sharply disillusioned as to the success of germanization in the Reichsland.

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and social. Economically the Reichsland has made enormous progress, hand in hand with Germany ; with the Rhine as an artery and not a boundary, communications are greatly improved and traffic increased. Viticulture freed from French competition, and weaving freed from English competition and adapted to new markets; iron-works in Lorraine brought into touch with German coalfields—all have prospered to such an extent that even those of the natives who still consider themselves French by education and sentiment confess that their interests are with Germany. The miners' leader, Hue, said in the Prussian Landtag on Feb. 18, 1916, that a return to France would be the death-blow to millions of workmen : it would be a disaster to Germany and Alsace-Lorraine alike. Socially the natives are much better off under German education, German law for the protection and insurance of workmen, and German institutions in general, than they were under France. In Feb. 1916 the provincial councils of Upper and Lower Alsace resolved unanimously that the economic welfare of the country could continue only in its connexion with the German Empire, as its social future was possible only in union with the life of the German people as a whole ; and the council of Lorraine at the same time expressed its confidence in Germany in similar terms. Throughout all these years of annexation, the author claims, the enemy to peace has been, not the Alsatian or Lorrainer, but France and England, jealous of Germany's industrial development. There is no external question of Alsace-Lorraine ; there is only the internal question of the country's development on the lines of Social Democracy.

Such is the case as now stated in Germany, not by Prussian bureaucracy, but by the representatives of the German working-class, convincing themselves that their interest is to hold the Reichsland at all costs.

On the other hand, lecturing at Essex Hall, Nov. 17, 1917, Dr. Georges Weill, of Strasburg, formerly (from 1912) member of the Reichstag as representative of Metz, and now a captain in the French army, protested strongly against the view that Alsace-Lorraine would still be satisfied with remaining a member of the German Empire. He said that, with others, he had advocated self-government as a German State, in the days before the present war, as the expression of the best they thought then possible, not as their actual ideal. But the

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position was altered. The population is still non-German, in the sense that it has no sympathy with the German culture and political aims which grew up during the century before the annexation, when Alsace-Lorraine was a land foreign to Germany and had no share in German ideals. In a few months after August 1914 more than 16,000 Alsatians and Lorrainers deserted from the German army,[1] and in August 1917 the Socialists of the province issued a protest, addressed to Mr. Branting, president of the Socialists at Stockholm, declaring that they were opposed to any peace terms which should rest the return of Alsace-Lorraine to France on a plebiscite, in the existing state of the country. The redintegration of the provinces into France was, Dr. Weill said, the necessary condition of a lasting peace.

French Socialists, however, were understood in England to have accepted the principle of the *plébiscite*; and in this understanding the English Independent Labour Party adopted it on December 17, 1917, in place of the principle they expressed in the previous August, 'that the people of Alsaçe-Lorraine shall be allowed to satisfy their inflexible desire for restoration to the French Republic'. But as the 'people' include a large number of immigrants from Germany and exclude a very great number of emigrants of Alsatian and Lorraine birth and interests—as also a vote taken under German direction might not express the real feeling even of the present inhabitants—neither the French nor the English Government has concurred in accepting the formula of settlement by referendum. On December 29, 1917, Mr. Lloyd George, speaking to the Labour Conference, reviewed the various answers to the 'question of Alsace-Lorraine', and was emphatic in his insistence on the wishes of the French Government being respected, and not those of a section of the French people. In his speech to the Trades Unions (Central Hall, Westminster, January 5, 1918) Mr. Lloyd George said: 'We mean to stand by the French democracy to the death in the demand they make for a reconsideration of the great wrong of 1871, when, without any regard to the wishes of the population, two French provinces were torn from the side of France and incorporated into the German empire.'

This was followed by a letter to the newspapers (January 8,

[1] It may be added that such desertions were still going on in January 1918.

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1918) from M. Albert Thomas, the Socialist leader, denying that the French Socialists had rested their case on a plebiscite of Alsace-Lorraine in present conditions. Claiming to represent an overwhelming majority of his party he repeated their views [1] thus: 'It was in violation of the right of peoples to self-determination that Alsace-Lorraine was wrenched from France; the Treaty of Frankfort has been torn to pieces by Germany's own will in 1914; . . . therefore Alsace-Lorraine must come back to France. But, he added, for himself and some of his friends, he adopted the formula of the Republican League of Alsace-Lorraine, 'that a consultation cannot be forced upon these populations; it belongs to Alsace-Lorraine herself to assert in her own way, at the moment and in the form she prefers, her will to belong to France'.

From this statement of aims there was immediate dissent on the part of the Socialist Minority in France, and by Mr. Philip Snowden, as representing British Socialists, who said (January 11, 1918), 'The British Socialists are indifferent whether the provinces remain German or French so long as an agreed settlement is reached.' On the same day, in the French Chamber, M. Pichon, president, said that France desired a peace of justice consecrated by the restoration of right violated in 1871. 'This', he added, amid a manifestation of cheering such as has rarely been witnessed in the Chamber, 'was superior to all hypocritical plebiscites.'

Alsace-Lorraine and the War

The position taken up by Hermann Wendel (see above, p. 232), namely, that the Reichsland is really pro-German apart from a small but noisy minority of sentimentalists, *bourgeoisie*, and tub-thumpers, might plausibly have been defended before the war. It is just conceivable that a tolerant and supple German administration might have won Alsace-Lorraine to a contented acquiescence in the position of an autonomous State of the German Empire.

But the events of 1914 made this for ever impossible. The Reichsland at once became the scene of military operations. On the one hand the French overran a large area of Upper

[1] Previously stated by Renaudel in *L'Humanité*, June 24, 1915, and as delegate to the British Labour Party in January 1916.

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Alsace and of German Lorraine. Their reception was enthusiastic beyond all expectation. No *bourgeois* minority, but the whole working population of the towns, the whole peasant population of the country districts turned out to cheer, to throw flowers, and to feast the French troops.

On the other hand German forces were concentrating in the east and north of the Reichsland. The German military mind cared nothing for the rapidly advancing germanization of its brothers rescued from the French yoke ; the military tradition was to regard the Alsace-Lorrainers quite simply as an enemy population. The Zabern incident was not in any way singular ; it was symptomatic of a permanent relation. Accordingly when the German troops entered Alsace twelve regiments at least,[1] beside other troops, received formal orders, on crossing the Rhine, to the effect that they were now in enemy country. Consequently they looted and destroyed at will, and the inhabitants were unable to obtain redress, as it was replied to their representations that the offenders ' believed themselves to be in France '.

Distrust in the loyalty of the Reichslanders was not confined to the army. Already in 1906 it was known in France that every police office in Alsace-Lorraine had two secret lists, brought up to date year by year, containing the names respectively of inhabitants who were to be expelled from the country on mobilization and of those who were to be arrested and imprisoned. These lists were not military compilations, but were prepared and issued by the imperial minister at Strasburg. They were put into operation during the last week of July, 1914, when every possible leader of an anti-German movement was arrested.

The temporary French occupation served both to accentuate and to provide overt expression for pro-French feeling. The natural consequence was that on the reoccupation by German troops of Mulhouse and other parts of Alsace, as well as the whole of annexed Lorraine, it was easy and natural to take reprisals for the crime of *Franzosenfreundlichkeit* and disloyalty to the Empire. The reign of terror under which since then the

[1] 110th, 111th, 113th, 131st, 136th, 143rd, 144th, 169th of the line ; 145th reserve ; 40th, 109th, 110th Landwehr. Also 2nd battalion and 14th reserve battalion of Engineers, 3rd Sanitary Company of the XVI Corps, and 2nd of XXI Corps.

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Reichsland has been suffering was rooted in two motives: first the military motive, secondly the political.

It was clear to every one that the population, with the sole exception of the German immigrants since 1870, was strongly pro-French. Consequently the German forces felt themselves as insecure as in Belgium or occupied France, and performed acts of terrorism in order to cow the natives into submission and to stamp out in advance any possible activity of *francs-tireurs*. The civil government on the other hand found itself faced with the problem of administering a population in a highly excited condition, and liable at any moment to demonstrations of pro-French sentiment. The result was an enormous crop of convictions for such demonstrations, imposed by special courts instituted for the purpose.

Thus the relations between the Alsace-Lorrainers and the Imperial Government during the war fall under four main heads:

1. Military terrorism in the provinces.
2. Condemnations for *Franzosenfreundlichkeit*.
3. Conduct of Reichslanders in the German army.
4. Attitude of the Government towards the population.

We shall add a brief note on each of these heads in turn. No facts will be cited or used as a basis for generalization except those established on absolutely certain evidence; the immense majority are drawn from German official publications.

1. *The Conduct of German Troops in the Reichsland.*—We have observed that many regiments were ordered to treat Alsace-Lorraine as enemy territory. We shall not describe in detail the atrocities which resulted. It will be enough to say that the villages which had welcomed the French (including an entire suburb of Mulhouse) had to pay for it in some cases by complete extinction, in others by the murder of a greater or less number of inhabitants; that farms where the French troops had been received were burnt and the inhabitants massacred; that pillage has everywhere been quite general; and that recently a systematic spoliation, not unlike that by which the factories of Belgium were gutted, appears, from various indications, to have begun (1918). Here may be also mentioned the very numerous deportations *en masse*, affecting whole districts of French-speaking Lorraine and Upper Alsace.

2. The evidence on this head is extremely voluminous and comes entirely from German official sources.

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Cases of treasonable conduct were dealt with either by the ordinary courts martial, composed of officers and military judges, or extraordinary ones created after the proclamation of *Kriegsgefahrzustand* and composed of military and civil members. These latter sat at Metz, Strasburg, Thionville, Saargemünd, Mulhouse, and Colmar. Their minutes, officially published, are in our hands.

It is difficult to give any idea of the number and variety of the cases dealt with by these courts. The delinquents belong to every class and district, every trade and profession; the immense majority are working men. Their crimes are all instances of *Franzosenfreundlichkeit*, ranging from espionage or other treasonable acts to a casual 'Vive la France!' in a public house.

The accusations come under three rubrics. First, high treason; espionage (including such acts as showing the way to French troops during their occupation) and desertion, and cases such as that of the nuns whose treatment of German wounded 'left much to be desired'. Secondly, aiding and abetting or inciting to desertion; this would of course include allowing or encouraging a son to join the French during their occupation. Thirdly, anti-German sentiments, a rubric which includes a vast number of curious sentences. Any one who criticized German war methods, who alleged that German soldiers had stolen goods from his farm, who seemed to grudge giving German soldiers the goods they asked for, who cast doubt on the invincibility of the German arms, who gave a cigarette to a French prisoner, was imprisoned. A remarkable feature of these sentences was the great number passed upon priests, mostly for criticizing from the pulpit the military terrorism of the Germans, but also for neglecting to preach about German victories and to pray for the success of Germany. But the vast majority were imposed for the expression in conversation of anti-German sentiments; for saying that the German Government caused the war, or that the Germans would get beaten; or for saying 'Down with the Kaiser' or 'Vive la France'; or for singing the *Marseillaise* or talking French. The list of such condemnations contains many hundreds up to the summer of 1918. The prisons cannot hold all those who have been sentenced, and tickets are issued entitling them to go to gaol in rotation. These are proudly exhi-

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bited in the family drawing-room, like invitations to dinners and dances.

3. The strength and universality of the anti-German feeling in the Reichsland can in no way be more clearly seen than by inspecting the position and conduct of the Reichslanders in the German army. It is notorious that in 1872 there were 33,000 men liable to military service in the Reichsland, of whom only 7,000 presented themselves, while of these barely 3,000 were found fit to serve. As late as 1878 and 1879 about a quarter of those called up failed to appear.

This refractory spirit, which naturally abated in the course of time, was greatly inflamed in 1914 by the fact that the Reichslanders were called upon to fight the France to which they looked as their true country. The result was an enormous crop of desertions. Reichslanders everywhere took oaths not to fight, and to desert to the French or English lines upon the first opportunity. Some refused to wear the German uniform ; many were shot by their officers for firing over the heads of the enemy. It is not surprising that they were singled out for especially harsh treatment by officers and N.C.O.'s ; that they went short of rations or leave, and were given the most dangerous work. As early as 1913 the officer commanding at Metz ordered that no Alsace-Lorrainer should be employed in the telegraph, telephone, or railway service, or upon works of fortification ; and in January 1916 the Ministry of War issued a confidential circular ordering the removal of all Reichslanders from the western to the eastern front or to garrison duty in the interior of Germany ; and advising their removal from all posts in which they could acquire information as to movements of troops or any organization, staff appointments, and so forth.

Later, we find regimental orders in which it is announced that all Reichslanders in the ranks are to be treated as suspect, employed in labour battalions, and forbidden to smoke or talk. At the same time the Germans were carefully advertising the loyalty of the Reichsland by conferring disproportionate decorations and publicity upon those immigrant Germans who had done good service in the war.

Already by the end of 1914 there were 16,000 Alsace-Lorrainers serving in the French army : by the end of 1915 the number of deserters as officially reckoned by the Germans was over 30,000. The lists of names, including both persons

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deprived of their German nationality for failing to present themselves on mobilization, and persons condemned to various penalties for desertion, are extremely interesting, showing as they do that the recalcitrant elements are to be found in all strata of the population and in every part of the country. Reckoning the mobilizables as roughly 10 per cent. of the population, it will be observed that, according to the official German figures, one-fifth of the total military strength of Alsace-Lorraine deserted in the first seventeen months of the war.

4. *Attitude of the Government towards the Population.*—Under this head we may notice various facts which are indeed connected with the sentences of the courts martial and with the terrorism of the German troops, but cannot be grouped under those heads. The wholesale arrest and deportation of persons whose names appeared on the police black lists ; the suppression of the half-dozen leading papers of Alsace-Lorraine ; the suppression of various sporting and other clubs, regarded as centres of Francophilism ; these and similar actions were so sweeping and violent in their methods and their extent as to excite public opinion in Germany itself. A public protest was made by Hermann Wendel, who pointed out that in these cases—amounting to thousands—there was no pretence of trial or any legal form. Persons suspected as 'undesirables' or delated for any reason by a German immigrant neighbour simply 'disappeared as if the earth had swallowed them'. A barmaid member of the Pan-German League, Strasburg branch, boasted that she had thus secured the arrest of 128 persons. It is instructive that at Weissenburg, on the very border of the Palatinate, the last town in the Reichsland to which French influence would penetrate, a large number of inhabitants were arrested for Francophilism three days before the declaration of war and imprisoned in the fortress of Bitche.

Compared with these secret arrests most of the repressive measures of the Government seemed a policy of pin-pricks. Thus all French names of villages, streets, &c., in French-speaking German Lorraine were superseded by German ones, invented for the purpose by ingenious officials ; all letters were delayed several days by the censors, and enclosures purloined, while letters extending to more than four pages, or written illegibly or in dialect, or containing 'abbreviations or allusions',

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were stopped ; bishops were officially ordered to abolish certain features in the Church services of their dioceses which were related more closely to the French than to the German ecclesiastical tradition ; fines were imposed upon persons found speaking French, or meeting more than three together, or travelling to the next village without a permit.

The result of this policy has been quite clearly appreciated by loyal Germans who know Alsace-Lorraine. We find them saying publicly, in the Reichstag and in the press, that Alsace-Lorraine is living through a reign of terror comparable to the worst periods of the Roman Empire ; that all the good work done there by Germans since 1871 has been destroyed ; and that after this war it will be far harder for Germany to win the goodwill of the population than it was after the annexation.

It would be easy to multiply quotations and references ; but it will perhaps be enough to quote one article from the leading pro-German paper in Mulhouse, if the reader remembers that this is by no means an isolated outburst. The author, it will be observed, takes the view that germanization really had made strides between 1905 and 1914, and that the Reichsland was in a fair way to 'come round' ; but that the brutality of the military methods and the stupidity of the administrative have undone all this and have forced the Alsace-Lorrainers into implacable anti-Germanism. Probably he, like others, greatly overrated the extent of the germanization ; and what really happened in 1914 was not so much a revulsion of popular feeling as a revelation of what the feeling had always been, and a bitter disillusionment for those who, with more zeal than judgement, had worked for and believed in the germanization of Alsace-Lorraine.

'The Francophilism of the capitalists persisted. They sought their business connexions and their recreations at Paris and Nice ; Germany was to them a geographical expression, an unknown country. The other classes of society conformed to this fashion either by preference or by compulsion. Every wage-earner knew that to obtain promotion he must express anti-German sentiments ; and it was the same for tradesmen and shopkeepers. A hairdresser, for example, must have worked at Paris, either as master or apprentice, if he wished to open a shop ; a few days under the greatest fraud in Paris

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would stand him in better stead than a long service with the best firms in Frankfort or Berlin.

'A marked improvement set in when, from 1905, socialism and syndicalist ideas, with their methods borrowed from German organizations, began to take root. The agitation in favour of Christian socialism—again a German invention—followed. All parties were obliged to bow to German tendencies. But the Catholics called their organization the "Alsace-Lorraine Branch", out of fear that to call it a "German Branch" would be a bad advertisement. The Liberals too never dared to affiliate themselves officially to the similar organizations in Germany; they feared that if they did so the Catholic organization would too obviously outmatch them.

'Then came the war, which upset everything like a whirlwind. It blotted out all the effects of past work. The French occupation of considerable districts of Alsace-Lorraine, twice repeated, made the situation still more difficult. The absence of a solidly based national consciousness, the mixture in our territory of true Germans with foreigners and half-Germans, the close connexions between many Alsatian families and France—all this contributed to cause a ferment of feeling which finds its melancholy echo in the numerous condemnations, and its lamentable consequence in the wholesale desertions.'[1]

The object of this section, it will be noted, is not to describe the conduct of Germany in governing a subject race; we know what these methods are from the cases of Poland and Slesvig. Nor is it to describe the methods by which Germany occupies enemy territory in time of war; we are acquainted with these in the case of Belgium. The whole point of the preceding pages lies in the fact that Alsace-Lorraine is constantly alleged, both in Germany and elsewhere, to be—on the whole—a convinced and loyal section of the German Empire. This allegation is of supreme importance, because upon it rests the only real argument for Germany's claims to the Reichsland. Even the latest and best English writers on the subject, men who show no taint of pro-Germanism, are ready to assert that popular feeling in Alsace-Lorraine inclines on the whole towards Germany, or at least that it is impossible

[1] *Mülhauser Volkszeitung*, Oct. 1915, the organ of Emmel, the (German immigrant) Socialist deputy.

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to say definitely to which side it leans. 'No data exist', they say, 'for determining the will of the population.'[1] This is a complete mistake. Data do exist; they are precise, authentic, and voluminous. They prove two points.

First, that public opinion in Alsace-Lorraine is overwhelmingly and bitterly hostile to Germany. It makes little difference whether this hostility has always existed beneath the surface, or whether it is mostly due to the stupid and brutal conduct of Germans since the declaration of war, though the evidence is strongly in favour of the first hypothesis.

Secondly, that the German Government and higher command, together with a quite considerable body of educated opinion, are perfectly aware of the fact. They know that the Reichsland is an alien territory, held by force and controlled by terror; they have definitely given up hope of winning its friendship and goodwill. This does not mean that they wish to part with it; for it is still Reichsland—the property of the Empire, precious economically and strategically. But the old myth of its being ethnologically and politically German has been once for all exploded.

Alsace-Lorraine is for Germany an enemy country, and the Alsace-Lorrainers a recalcitrant subject race. No one acquainted with its history since 1914 can pretend to deny these facts.

Conclusions

Certain inferences, not without political importance at the present time, can be drawn from this history.

1. The German historical claims to Alsace-Lorraine are based partly on past history, partly on the conditions of to-day.

(*a*) They claim that Alsace-Lorraine 'returned to Germany' in 1871. This involves two fallacies:

First, it assumes that the Germany of 1871 was identical with the ancient Holy Roman Empire. But the Empire was founded by the Franks, included at one time all Christendom, abandoned Alsace-Lorraine by treaty after proving incompetent to administer or retain it, and was finally allowed to go to ruin by its holders, the Austrian Habsburgs. If the modern German Empire claims the heritage of the Holy Roman Empire, it claims all the States of Europe.

[1] The phrase comes from *Problems of the Peace*, by W. H. Dawson, a well-known and in many ways authoritative writer on Germany.

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Secondly, it assumes that the people of the Reichsland have always been German in race, language, interests, and sentiments. But they have in fact always been—and still are—a mixed race, having close relations both with France and Germany; borderers, with the independent habits and ambitions of a border-land, though they never won so complete a freedom as their similarly situated neighbours in Switzerland.

(*b*) They claim that the Alsace-Lorraine of to-day is united to Germany by political and economic ties.

First, they still persist in representing the Reichslanders as Germans in sympathy, life, and habit, as well as in speech; whereas there is a considerable social gulf between the native Alsatian and the immigrant German, and the extent and depth of the Reichslanders' Germanophobia is now beyond controversy.

Secondly, the argument that severance from Germany would be ruinous for the industry of the Reichsland may have had weight before the war. But it has none at all now, for these industries are already ruined, and in reconstruction a revival of the German connexion is not the only possible condition.

2. The French claims raise certain historical difficulties.

(*a*) That Alsace-Lorraine was a part of ancient Gaul is not a serious argument; the population has been predominantly non-Gallic for at least 1,500 years.

(*b*) The vast majority of the population is certainly anti-German, and, on the whole, pro-French. But first, large numbers of Francophils emigrated after 1871, or have been executed, deported, exiled, or killed in action since 1914, and their places taken by Germans; the presence of these, and the absence of the former, must make any settlement (on the lines of self-determination or indeed any other) difficult. Secondly, anti-German feeling is not synonymous with loyalty to France. It is true that the 'Autonomist' party has collapsed and that the bulk of the population desires union with France; but it does not follow that the very independent and particularist Alsatian will be easy for the French Government to administer.

The French conquest and retention of Alsace-Lorraine from the seventeenth to the nineteenth century was achieved in virtue of superior military power backed by a superior civiliza-

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tion. It is now clear that that conquest, begun by the former factor, was rendered to some extent permanent by the second. Alsace-Lorraine was indelibly stamped with the mark of France. Such phrases are not rhetoric; they are the only way of expressing concisely the whole history of the country since 1870. That they are true is well known by all who have studied the country; best known of all by the Germans who have tried to rule it.

NOTE A

The 'Tearing-up of the Treaty of Frankfort'

It is often alleged that the aggressive war made by Germany against France and her allies in 1914 automatically annulled the Treaty of Frankfort. This view is widely current in France and is often expressed by English writers. It would no doubt facilitate the issue if such were the case. The treaty of 1871 becoming null and void, Alsace-Lorraine would simply lapse without further trouble to France; there would be no need of formal cession on the one side or annexation on the other, or of any such machinery as that of the plebiscite.

But legal authorities are agreed that the events of 1914, however firmly they fix the responsibility for the war upon Germany, have no bearing on the validity of the treaty. Two examples will suffice.

1. Sir H. Erle Richards, in his introduction to Messrs. Oakes and Mowat's *The Great European Treaties of the Nineteenth Century* (1918), admits that in general war is considered as having the effect of abrogating treaties. But several groups of treaties are excepted from this general rule. First, some treaties are deliberately designed to operate in the event of war and to control its usages, such as the Hague conventions, or treaties of neutralization. Clearly these are not abrogated by a state of war.

Secondly, all treaties affecting third parties; these cannot be annulled by war between the contracting parties.

Thirdly, treaties which have been fully executed. Thus if two States conclude a peace as a result of which one pays the other an indemnity, and fifty years later they fight again, the original recipient does not automatically become liable

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for the amount of the indemnity. Similarly, if territory is ceded, and after the transfer is accomplished war again breaks out, the title of the possessor is not thereby invalidated.

2. Mr. Coleman Phillipson (*Termination of War and Treaties of Peace*, pp. 250–68 ; *Alsace-Lorraine*, p. 151) lays down that a treaty which involves a cession of territory, delimitation of boundaries, creation of servitudes and so forth, is a *dispositive* or *transitory* treaty, i.e. one which establishes a permanent condition of territorial rights and therefore cannot be affected by war between the parties.

These authorities accordingly agree that the Treaty of Frankfort possesses binding force till superseded by another formal treaty.

Clearly, however (and this is a point emphasized by Mr. Phillipson), a distinction must be drawn between the legal nullity of a treaty and its condemnation by the general moral sense of the world. The Treaty of Frankfort has resulted in endless oppression and friction and waste of energy and life ; as such, it is iniquitous, and is by now very widely recognized as iniquitous. But this has nothing to do with the war of 1914, though it is only the developments of the war that have made it no longer possible to doubt how deeply the annexed population has always been conscious of the wrong done to it in 1871.

NOTE B

The German View of Alsatian Feeling in 1870

The annexation of Alsace-Lorraine was so confessedly a German ' war-aim ' during, if not actually before, the Franco-Prussian War, that some interest attaches to the question, How did Germany conceive the attitude of the Alsace-Lorrainers towards Germany ? In point of fact the protests which accompanied the annexation proved that Alsatian feeling was definitely and strongly against union with Germany ; but it is desirable to ask how far Germany was aware of this feeling before she was committed to the course of annexation.

The theory that Alsace-Lorraine was a lost part of Germany which must now be reunited to the body of the German people did not, as has been pointed out (footnote, p. 153), necessarily imply that the Alsace-Lorrainers wished for reunion. Probably

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some such implication was intended by Max von Schenkendorf, when he wrote (about 1815):

Doch dort an den Vogesen,
Da liegt verlornes Gut;
Da gilt es, deutsches Blut
Vom Höllenjoch zu lösen.

The last two lines would be meaningless unless they implied a belief that Alsace would gladly throw off the 'hell-yoke' of French rule. But this belief in the pro-German sentiment of Alsace-Lorraine, not uncommon in the generation of Arndt, was quite out of date in 1870. Evidence on this point is easily accessible; it consists of a number of pamphlets, including some written by the most eminent German scholars of the time, and dating from the years 1870–1.

Thus von Treitschke (*Was fordern wir von Frankreich?* 1870) proposes to annex 'the German parts of Alsace and Lorraine with as much French territory as will make them safe', i. e. the fortresses and districts of Belfort and Metz. 'Shall we renounce both these strong places in deference to an untenable dogma?', viz. the idea that French-speaking towns ought to belong to France. He recognizes, indeed he emphasizes and illustrates with a wealth of detail, the intense anti-Germanism and French patriotism of Alsace-Lorraine as a whole. Use of the French language, he says, is not only widespread in Alsace, but it is growing. The women especially read French books, talk French, and copy French manners; the rising generation will therefore be even more gallicized than the present. 'The language of administration, of polite society, of the large manufacturers, of literature and the press, is French.' The great ancient families have all either emigrated or become fervent French patriots.

Treitschke thus proposes to annex Alsace-Lorraine in defiance of the perfectly well-known inclinations of its population. This never even suggests itself to him as a valid argument against the annexation. He begins his dissertation by exclaiming, 'to enumerate the grounds on which we are pledged to make the demand would be like offering proofs that the earth is round', and accordingly he does not attempt to do anything so unnecessary. His view is that France, spared in 1814 and 1815, is a permanent danger to the world's peace, only to be checked by the extremest violence. Germany's mission is to

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cow France, to ' break the teeth of the beast of prey ', and so to provide Europe with a lasting peace.

' Who dares object, in view of this our duty to secure the peace of the world, that the Alsace-Lorrainers do not wish to belong to us ? In face of the holy necessity of this great day, the doctrine of the right of all German peoples to self-determination—a lure of landless demagogues—becomes a mockery. These lands are ours by the right of the sword ; we shall rule them in the name of a higher right, the right of the German nation, which cannot leave her lost sons for ever parted from the German Empire. We Germans, who know Germany and France, know better what is good for the Alsatians than those poor creatures themselves, who in their gallicized existence have remained without true tidings of the new Germany. We will restore to them their true selves against their own will.' Here Treitschke appeals to posterity to justify the annexation—an appeal which has by now had its hearing with a result very different from his expectations.

Von Sybel's pamphlet (*Der Friede von 1871*) is written in a quite different vein ; the studied moderation of its tone reminds us that it was composed for English readers. The author develops a long historical argument, setting forth the historical claims of Germany ; he asserts that the Alsatians and many Lorrainers are racially Germans ; he argues that the Vosges give a scientific frontier, while the Rhine frontier is a geographical anomaly. The Alsace-Lorrainers, he confesses, do not want to be Germans. Well, he continues with disarming candour, it does them credit. They grew up under France, a great nation with fine traditions, and no one respects them the less for feeling a proper patriotism towards her. But their affections, artificially canalized towards France, will soon (we hope) flow back into their natural German channel. Germany has much the same gifts to offer as France ; she too is a great nation with a vigorous intellectual and economic life ; and she can give Alsace-Lorraine better education, better local government, more complete religious freedom. As for the principle of self-determination, it is ' either a flimsy triviality or a lie '. When great nations agree to rectify their frontiers in order to secure peace, the frontier-dwellers ought to sacrifice their petty parochial preferences to the common good. No one wants unwilling Alsatians to become Germans ; any one

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who prefers to do so is free to emigrate. But the well-being of 80,000,000 cannot be made contingent on the caprices of 1,250,000, even supposing them unanimous. Sybel goes on to show that the French in the past (seventeenth and eighteenth centuries) cared little for the principle of self-determination, and quoted scornful remarks on the subject made by Thiers as late as 1867. In short, by means of skilful exaggeration and an unerring choice of things to say and things not to say, Sybel presents a case whose sweet reasonableness must have appealed as strongly to one section of pro-German opinion in England as Treitschke's fulminations no doubt appealed to another.

A useful pamphlet was published by Auerbach (not the French geographer; *Wieder unser*, 1871), who writing from a considerable personal knowledge of Alsace and rather in the vein of the journalist war-correspondent than that of the propagandist lays emphasis on the anti-German sentiments of the Alsatians. He quotes in full a proclamation by von Beyer, commanding the Baden division, defending the severe reprisals which he had taken for the 'cruelties and brutalities' perpetrated by Alsatians on the German troops. Auerbach also describes how St. Moritz, near Schlettstadt, was destroyed because during a skirmish civilians were alleged to have fired on German cavalry. There is nowhere a suggestion that the Germans ever expected Alsace to welcome them as deliverers, in the way in which French troops were welcomed in 1914.

In the collection of *Letters on the War between Germany and France* (London, 1871) the anti-Germanism of Alsace-Lorraine is everywhere recognized. By some writers it is slurred over and minimized; thus Max Müller writes: 'with the great mass of the people in Elsass, I believe the difficulty will be much smaller than we suppose. They are all German by blood, many by language, and, what is most important, they are still German by the simplicity and honesty of their religion. We are told by English travellers that many of the peasants even now, if allowed to vote by ballot, would vote for Germany.' This is by the way. His main argument is that Germany, having been wantonly attacked by France, is justified in exacting a more severe penalty than any mere indemnity.

Mommsen, in the same collection, comes nearer than any other writer of the time to asserting that Alsace-Lorraine was

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pro-German. Only after dilating at great length on the theme that 'the population of Alsace is purely German', by which he means German-speaking, does he remark, in an aside as it were, 'I do not mean to prove that in these subjected provinces of Alsace and Lorraine France has no friends and Germany no foes'. Mommsen again stands alone among all the pamphleteers of the time in actually having an anecdote indicating pro-Germanism on the part of an Alsatian.

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PART III

ECONOMIC CONDITIONS

Agriculture, live-stock, and forestry; mineral resources; mining and industry; roads, railways, and waterways.

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CHAPTER XII

AGRICULTURE

In spite of the great industrial developments of southern Alsace, the Vosges valleys, and northern Lorraine, agriculture is still the chief resource of the country. On the Lorraine plateau it is for the most part untouched by modern industrial developments; the system of ownership and cultivation has suffered no change for many centuries, and the population is, physically and mentally, a population of farmers. In Alsace, where the soil is mixed—often poor and often very rich—the primitive methods have been greatly modified. Intensive cultivation has gained a footing; many farmers combine their agricultural work with labour in factories or home industry; and the old rigid rotation—wheat, oats, fallow—which still obtains on the Lorraine plateau has been superseded by a more economical and profitable succession of crops. In the hills a third type of agriculture is found: grass-land predominates, and cornfields disappear in favour of irrigated meadows and potato-fields. The grass summits of the Vosges are grazed all through the summer by herds of cattle; and here and there the primitive method by which waste land is burnt off and tilled every ten or fifteen years still lingers.

Agricultural methods and rural life have certainly improved in the last generation. But they are still in many ways backward, even in Alsace. The Alsatian small farmer is only a little more progressive than the dour and hard-working Lorrainer. The German Government has tried to assist agriculture in the Reichsland, but not always successfully; and a more congenial and sympathetic Government may succeed where German thoroughness has failed.

Climate in relation to Agriculture

The low-lying districts of Alsace-Lorraine have a decidedly warm climate, which produces a marked effect upon the agriculture of the plain, foothills, and Vosges valleys. The

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development of viticulture is especially noticeable (the Reichsland is the chief wine-growing district of Germany in proportion to its area), but it does not stand alone. Tobacco and maize are largely grown in Alsace, and such warmth-loving trees as the chestnut flourish.

In general it may be said that the Alsatian plain has a mean annual temperature of 50° F.; the Lorraine plateau 45°, though its valley-bottoms approximate to that of Alsace; and the high ridges of the Vosges 40°, or even lower. The warmest, as well as the driest, region is to be found not in the plains but in the foothills, especially where they are sheltered by the greatest height of the crystalline Vosges. Here the rainfall is only 20 in. —a very low figure; in the Rhine plain at large it averages 24–30 in.— while the Lorraine plateau has 25–35 in., the Sundgau (not protected by the Vosges, and exposed to west winds passing through the Gap of Belfort) 30–40 in., and the Vosges summits about 80.

The foothills are thus both the driest and warmest part of Alsace-Lorraine; they have more sunshine and less frost than any other part. This observation is reinforced by the especial excellence of their wines, by the presence of peaches and almonds, and by the occurrence of such fauna as the green lizard and the praying mantis.

Soils

From the geological sketch of Alsace-Lorraine (Chap. V) the general distribution and character of the soils may easily be inferred. A brief summary of their main characteristics from the agricultural point of view will suffice for this chapter.

Vosges.—All over the sandstone Vosges the soil is sand or a sandy loam; generally light and dry. The crystalline Vosges have considerable stretches of peat and humus, the so-called *Hautes Chaumes*. The valley-bottoms are partly dry gravelly soil, partly peat and humus. All soils throughout the Vosges agree in having a very low percentage of lime.

Rhine Plain.—The soils of the Rhine plain are remarkably various. They include gravel, sand, loess, and loam; here and there clay or humus. Wherever the gravel comes to the surface, or nearly so, the soil is sterile; this is especially the case in the Ochsenfeld, where the gravel comes right to the surface, and, to a less extent, in the Hart, where there is almost everywhere a

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little loam or sand on the surface, making this region less utterly sterile than the Ochsenfeld.

Sandy soils are especially frequent in Lower Alsace, where the rivers of the sandstone Vosges have formed deltas in the plain. These are often sterile, but not always so : where they contain a certain amount of clay or humus, and are well supplied with water, they may be highly fertile, as in the case of the hop-fields of Hagenau.

Marshy humus occurs especially in the Ill valley above Schlettstadt, the Andlau valley between Benfeld and Geispolsheim, and the Zorn valley between Reichstett, Wanzenau, and Hördt. All these districts are distinguished by the name of ***Reid***, which is applied *par excellence* to the largest and most important of them, that on the Ill.

The proverbial fertility of Alsace (' quel beau jardin ! ' as Louis XIV said) is confined to the loess districts. The loess, whose geological history has been discussed above, is a light, permeable soil, easily tilled and never becoming waterlogged ; it contains a very high percentage (10–30 per cent.) of lime, and often a good deal of magnesium carbonate. It cuts easily, along watercourses or hollow roads, into vertical cliffs resembling sandstone cliffs in appearance ; and it often contains beds of loam which form water-bearing strata. Its surface strata often decalcify into a strong loamy soil of remarkable fertility. Where the unaltered, powdery loess lies on the surface, the soil is much less fertile.

The loess is confined to the Rhine plain and foothills, nowhere appearing in the Vosges or in Lorraine. Roughly speaking, it extends over almost the whole Sundgau and in a narrow belt along the foothills, reaching a considerable distance up their slopes. In the *Kreis* Erstein it spreads out into the plain, as also in the extreme north (*Kreis* Weissenburg) ; between these districts the plain is for the most part sandy.

Barren belts are often found, both in Upper and Lower Alsace, in soils that would appear from their general character fertile enough. These belts, locally known as *Heischeine*, are due to the formation of conglomerate or ' pan ' just below the surface. The pan generally lies eighteen inches down, and is a foot or more thick ; it is quite impermeable, so that the soil above it is waterlogged in wet weather and parched in dry ; manuring is on this account useless, and nothing will grow

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properly. It would seem that the only possible treatment is to shatter the pan by blasting. This was experimentally done in 1902, but information as to the results obtained is not available.

Lorraine.—The main characteristic of the Lorraine soils is their heaviness and tenacity. They are, in the great majority of cases, extremely clayey and require plough-teams of four or six horses. Almost all strata of the Muschelkalk and Keuper, and most of the Jurassic, yield heavy marl or clay soils. Local farmers distinguish soils according to their colour. *Terre noire* (*schwarzer Boden*) is the lowest of the Keuper marls ; *terre rouge* (*roter Boden*) and *terre grise* (*grauer Boden*, 'the worst soil in Lorraine') belong to the middle Keuper, though the light oolitic soil of the Haye is also called *terre rouge* ; *terre blanche* (*weisser Boden*) is a name applied to the sandstones of the lower Keuper and also to the light and sterile diluvial deposits.

The Liassic soils of Lorraine are decidedly better for agriculture than the Triassic, owing to the alternation of marl and limestone beds, which makes them less uniformly heavy and cold. The Lias is not only more permeable and friable than the heavy Keuper and Muschelkalk soils, but also contains phosphate beds, which increase its fertility.

Sandy soils are found in the St. Avold region, where the Bunter (locally called *Gries*) projects into Lorraine, and also here and there in the alluvial river-valleys, whose soil is for the most part gravelly or clayey. The most remarkable alluvial deposits are those of the Moselle round and below Metz. Diluvial soils, mostly gravel and known as *terre blanche*, occur in large deposits on the plateau, and are usually wooded.

The western terraces of Lorraine have considerable belts of light and arid soil, where the limestones come to the surface ; this is the case in the Haye, the Côtes de Meuse, and the Barrois.

The Land : Distribution and Ownership

The Reichsland contains 3,400 square miles of agricultural land divided into 244,948 holdings.[1] This gives an average area per holding of 6·87 acres. Of these holdings the majority (53 per cent.) are farmed by people for whom agriculture is a

[1] All figures are those of the 1907 census.

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secondary occupation ; but most of the holdings of this type are very small, 87 per cent. of them being under 5 acres and their average area 2 acres ; and their aggregate area includes only 18 per cent. of the whole agricultural land. Thus over four-fifths of the land is held by the 115,000 farmers for whom agriculture is their primary occupation ; and the average size of a holding among this class of farmer is 15·5 acres.

We shall hereinafter refer to these two groups of farmers as ' class A ' (agriculture primary or sole occupation) and ' class B ' (agriculture secondary occupation) respectively.

The holdings of class A are for the most part under 20 acres in extent. One-third of them are under 5 acres, another third between 5 and 12 acres, rather over a quarter between 12 and 50 acres, and of the remainder very few exceed 250 acres. In class B on the other hand seven-eighths are under 5 acres, one-tenth are between 5 and 10 acres, and very few indeed are over 50 acres in extent.

Taking the land as a whole, two-fifths of it is divided among plots of 12–50 acres ; 22 per cent. consist of plots of 5–12 acres, plots of under 2 and of between 50 and 120 acres each account for about 12 per cent.

The different districts have different characteristics with regard to the average size of agricultural holdings. Distinguishing five sizes of holding (size 1, under 5 acres ; size 2, 5–12 acres ; size 3, 12–50 acres ; size 4, 50–250 ; size 5, over 250), sizes 2 and 3 greatly predominate in Lower Alsace, where they occupy 33 and 40 per cent. of the total land, the remainder falling mostly into plots of size 1. In Upper Alsace 50 per cent. falls into size 3 and 21 per cent. into size 2 ; here the average holding is larger, and plots of size 4 occupy a respectable area. In German Lorraine on the other hand 33 per cent. of the land falls into size 3 and 31 per cent. into size 4 ; the average holding here is a good deal larger again. Indeed 12 per cent. of the land is occupied by plots of size 5.

Thus Lower Alsace is the home of the small plot. This is especially true of the *Kreise* Hagenau and Molsheim, while on the Kochersberg and near Weissenburg there is a tendency towards larger holdings. In Upper Alsace holdings are less diminutive ; in the Sundgau especially they tend to be quite a good size (size 3 strongly predominates). In Lorraine small plots are quite exceptional, apart from the industrial districts,

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where farmers of class B work small holdings ; in the Messin and the Saulnois size 4 predominates, and larger farms are not uncommon.

Of the whole agricultural surface of the Reichsland 70 per cent. is farmed by the owner and only 27·5 per cent. by tenants on leasehold. The remaining 2·5 per cent. is held by tenants on other systems. Here again the proportion differs in different regions. In Alsace three-quarters of all the land is farmed by the owners, though a very large number of farmers, in addition to farming their own land, rent a plot of some one else's. It appears not improbable that this is a consequence of the division of each estate into scattered plots, which makes it often convenient for two neighbours to rent small portions of each other's land. Thus in Lower Alsace, where 75 per cent. of the land is farmed by the owner, only 32 per cent. of the farmers work their own land exclusively, while about 60 per cent. farm holdings consisting mostly of their own land plus a small plot leased from a neighbour. The number of farmers who work holdings composed entirely of leasehold land is thus very small, amounting to only 8 per cent. of the total number.

In Upper Alsace the number of mixed farms is smaller, amounting to only 46 per cent. instead of 60. In Lorraine the proportion of mixed farms is the same ; but tenant-farming is here much more extensive. Over a third of the land is in the hands of tenants ; in the Messin and Saulnois the proportion rises to one-half. This is due to the large farms contained in those regions, which are in general leased to tenants and not farmed by their owners.

Of the farms in Alsace which are composed entirely of leasehold land the overwhelming majority are in the hands of farmers belonging to class B, and are very small. It is natural that the industrial workers who adopt agriculture as a secondary occupation should as a rule possess no land of their own and should merely lease a small plot.

In Lorraine, where leasehold is more prevalent than in Alsace, it is used for the purpose of preventing agricultural innovations. Thus almost every lease compels the tenant to maintain the rigid three-field system, with penalties if he fails to do so, and to leave one-third of the land fallow at the end of his tenancy ; his lease often forbids him to use artificial manure, and generally forbids the sale of any straw, fodder, or manure.

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These and similar customs are serious obstacles to any improvement in the condition of agriculture in Lorraine, though in recent years new symptoms of progress have appeared. *Métayage* is still found in many parts of Lorraine.

It was remarked above that the holdings of land in Alsace-Lorraine are as a rule subdivided into a number of small plots. These are often scattered somewhat widely over the whole area of the *commune*, and the average size of each plot is very small. This state of things, due to the system of inheritance, is a well-known feature of agriculture in all the Rhinelands, Belgium, and eastern France. It is a severe impediment to efficient farming because it is very wasteful in labour and makes it necessary to cross and recross the land of many different farmers in order to reach the various plots into which a single farm is divided.

A remedy which is a good deal employed in the Reichsland is to lease the outlying plots to the farmers whose land they adjoin, so that each farm consists of a patchwork of different men's property. But this is an insufficient remedy; the only satisfactory thing to do is to redistribute the whole land of each *commune* into regular strips, each owner getting an area equal to his original scattered holding, whether it consists of one strip or many. These strips can be approached at each end from a field-road. This process of redistribution (*Feldvereinigung*) has been energetically applied in north-western Germany, but very little in Alsace-Lorraine. Only in the *Kreise* of Strasburg and Mulhouse has it been adopted on anything like a large scale.

In some cases it appears that the process of redistribution was carried out long ago—certainly before the end of the eighteenth, and probably in the second half of the sixteenth, century; about a couple of dozen such villages are to be found in the Alsatian plain, especially between Mulhouse and Neu-Breisach. These form a highly interesting early example of the application of the process at an unknown date.

Attempts at redistribution and consolidation of plots have been made both by the French and the German Governments. Great obstacles have, however, always been encountered. The small holder does not always realize the practical gains involved, though to any one unused to the system of scattered plots its disadvantages appear overwhelming. Again he has a strong sentimental objection to parting with land which has

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been for generations in the family, or which he has purchased with his own savings. And the conservative instinct of the small farmer sets him against any sweeping change from the very outset.

Among such abortive attempts was a measure fixing the minimum area of plots. Vineyard holdings, by this measure, must not be under 235 sq. yds., and arable or grass plots not under 1,170 sq. yds. The opposition to this measure proved, however, so great that it could not be carried out. The authorities then (1884) passed a measure intended to facilitate redistribution by conferring powers of expropriation on the *Feldweggenossenschaften* (associations for the construction of field-roads). The construction of field-roads is intimately bound up with the redistribution of plots, since the purpose of such redistribution is to make each plot accessible from a road. This also failed, proving in practice too costly ; and was superseded by a measure of 1890, according to which exchanges of land could be effected within the boundaries of one *commune*, in order to facilitate access to plots and the construction of roads. This was found practicable, but has not been applied very widely.

The Agricultural Population

Of the total population of the Reichsland less than a third is now engaged in agriculture, and the figure is declining (1882, 42 per cent. ; 1895, 38 per cent. ; 1907, 31 per cent.). This does not merely indicate a stationary agricultural population gradually outstripped by an increasing industrial. The number of persons engaged in agriculture has actually decreased by 12 per cent. (from 646,000 to 568,000) in 25 years.

The proportion of agriculturists is highest in Lower Alsace (35·7 per cent.) ; lower in German Lorraine, where the rural districts are very thinly populated in proportion to the dense population of the mining and industrial regions (30 per cent.) ; lowest of all in Upper Alsace, whose old-established industries have not yet been entirely outstripped by the newer iron-works of Lorraine (28 per cent.). The gain of industry is not in every case a dead loss to agriculture ; for industry is in many parts of the country a good deal decentralized, and factory hands engage in agriculture as a secondary occupation. Home industries which permit this state of things are common in the valleys of

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the Vosges, and the same applies to the glass-works of Lorraine and the Low Vosges. In 1912 no less than 37 per cent. of the industrial workers in the Reichsland were settled on the land, and this figure shows a tendency to increase. German authorities see in this fact a guarantee of the stability of the rural population and a check to the emigration which ever since 1871 has devastated the Alsatian country-side.

The connexion between industry and agriculture in Alsace is facilitated by the tradition, established in the seventeenth century, that each village should be practically self-supporting. It thus became usual for each *commune* to grow industrial crops sufficient to supply the village with clothes, oil, &c., and rape, hemp, and flax were thenceforward grown almost everywhere. Though these crops have declined in importance since the rise of large-scale industries, they are still grown for local use, and the Alsatian farmer has in consequence a knowledge of several simple industries.

In the Kochersberg and Sundgau, and round Weissenburg and Schlettstadt, over half the population is engaged in agriculture. These are the most agricultural regions of Alsace. The proportion is lower in the remaining parts of the plain, and still lower in the Vosges valleys. But it might also be noted that the most purely agricultural districts are precisely those which have suffered most from emigration. This is especially true of the Sundgau and the Weissenburg district.

In Lorraine the population of considerable areas is exclusively agricultural, but these areas are very sparsely inhabited, and their population is decreasing. The birth-rate is low, and emigration is frequent. The agricultural inhabitants are industrious and simple ; their food is extremely plain, consisting almost exclusively of bread, vegetables, and wine, coffee and bacon being considered luxuries. Their villages are for the most part cramped and ill-constructed, and the reverse of sanitary ; in fact it is usual for farm-labourers to sleep in the byre. In Alsace life is a good deal more comfortable, though even here it appears that the labourer is ill-housed.

Of all persons engaged in agriculture in the Reichsland, 32 per cent. are proprietors cultivating their own land, 1·8 per cent. tenant-farmers, 52 per cent. are members of the farmer's own family, 5·7 per cent. farm-servants, 2·6 labourers who also own or rent plots of their own, and 4·8 labourers with no land

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of their own. These figures are interesting as showing the very great preponderance of proprietor-farmers (95 per cent.) over tenant-farmers (5 per cent.) and the small number of labourers (7 per cent.).

The Alsatian rural population lives in villages composed of single, detached houses: generally timber-frame houses with wattle and daub walls (or, in the newer houses, brick), and high, tiled roofs. Sometimes the larger houses are built round a court, with a *porte cochère* opening on the village street. The ordinary houses are built transversely to the street, with one gable-end facing on it. The houses are picturesque and tolerably weather-proof.

In the foothills, among the richer wine-growing Alsatians, the houses are mostly stone, and the villages more compact and town-like. In the Vosges again the style of building is quite distinct: stone houses are the rule, and the mountain farms, instead of being grouped in villages, are large single groups of buildings, each separated from its neighbours.

In Lorraine houses are usually built in continuous rows, each house touching its neighbour as in a city street; they are as a rule only two floors high, and the doors open directly on the village street, from which they are separated by a strip of grass belonging to the *commune* and used as a dumping-ground for manure, implements, and so forth.

It has already been remarked that since the middle of the nineteenth century the agricultural population of Alsace-Lorraine has fallen considerably in numbers. Thus, in Alsace alone, 496,000 persons were occupied in agriculture in 1861; in 1907 the number had sunk to 365,000, a decline of over 21 per cent. in 45 years. The number of farm-servants declined in this period by 50 per cent.; that of day-labourers by 72 per cent.; and that of the superior class of farm hands by 66 per cent. It will thus be observed that the decline affects employees only: the number of independent owner- or tenant-farmers working their holdings themselves, with assistance from their families, has, if anything, risen. Thus the fall in the agricultural population does not necessarily imply the decay of agriculture. Indeed the average agricultural worker is now distinctly better off than he was two generations ago.

The decline in the number of labourers and farm-servants has been due to two causes—industry and emigration. During

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the forties nearly 30,000 persons deserted the land in Lower Alsace alone under these two influences. The construction of railways and canals in the middle of the century had an unsettling effect on agricultural labour, and the war, annexation, and subsequent emigration continued to drain the land.

It is natural that wages should have risen concurrently with the growing scarcity of labour. Thus, in 1850 a man received £3 5*s*. to £6 a year in cash, plus lodging, food, and clothing, raising the gross wage to between £19 and £22. In 1911 the cash wage varied from £6 to £30, the gross wage from £38 to £55. Women's wages have concurrently risen from a gross annual wage of £15 or £16 in 1850 to a gross annual wage of £32 to £43, or for a housekeeper £43 to £49, of which about a third (on average) would be in cash. These figures refer to Alsace. In Lorraine, apart from the industrial regions, wages have risen less ; but in the richer districts round Metz a wage of £15–25 is not uncommon.

Agricultural Schools, Institutions, and Societies

There is a State experimental station at Colmar. It is mainly concerned with viticulture ; but it also studies other branches of agriculture. Thus the local strain of wheat has suffered much from the régime of small farming, and calls for improvement ; the same is true, in a degree, of the local strains of tobacco, grass, &c., as well as cereals in general. The Colmar station conducts experiments with a view to improving all these strains, and to raising the standard of seed throughout Alsace.

The Oberlin Institute of Viticulture at Colmar has assisted in reconstructing the vineyards of Alsace since the phylloxera invasion, and in spreading new and cheaper methods of training the vine.

Each *Kreis* has its own agricultural union (*Kreisverein*) engaged in improving local agriculture. Thus the Colmar *Kreisverein* is conducting experiments for the improvement of pasture in the High Vosges ; for the selection of potatoes for growing on mountain farms ; for the selection of cereals ; and for instituting strawberry-growing in the Münstertal. The *Kreisvereine* were established by imperial decree in 1888. They have cantonal sub-sections, and their function is to organize meetings, arrange lectures, circulate literature, provide

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implements, seeds, fertilizers, &c., supply picked animals for breeding, and hold local shows. They are subsidized by the State and include 39,000 members; they are organized into a single corporation (*Landesverband der landwirtschaftlichen Kreisvereine*) with a widely circulated journal.

The *Landwirtschaftsrat* is a body whose purpose is to mediate between the State and the agricultural interests. It includes, among other members, a representative from each *Kreisverein*; and it deals with insurance, instruction, co-operation, improvement in vegetable and animal strains, taxation, &c., and recommends action on the part of the State where it appears advisable. It has no executive powers.

It is hardly necessary to remark that numerous societies exist for the promotion of horse-breeding, stock-breeding in general, poultry-farming, bee-keeping, fruit-, hop-, and tobacco-growing, and so forth. Co-operative societies are described in the next section.

For administrative purposes the Reichsland is divided into seven districts, five in Alsace and two in Lorraine, each being supervised by an inspector with a staff of officials and experts. These are charged with State improvements connected with drainage, irrigation, connexion of streams and watercourses, dams, &c.—a work energetically pursued before 1870 by the French Government, both in the Vosges and along the Ill and Rhine, where much pasture was created out of swamp in the first half of the nineteenth century.

The Reichsland has a State veterinary service, consisting of a staff of *Kreis*, canton, and custom-house inspectors. The *Kreisdirektor* reports any outbreak of disease to the Ministry, which issues a monthly bulletin, based on these reports, for the instruction of farmers and other owners of live-stock. The subjects reported on are the effects of local climate and vegetation on the health of domestic animals, notifiable and infectious diseases, notes on veterinary, legal, and financial subjects, information as to the state of the market, &c.

The central School of Agriculture for Alsace is situated at Rufach. It provides technical instruction for well-to-do farmers' sons, and is classed among the Scientific Colleges whose certificate qualifies the holder for one year's volunteer military service. The course extends over two years, and includes theoretical and practical work; the fees are £2 4*s*. per annum

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for tuition and £2 per month board and residence in the hostel. The number of students is 80 to 100.

Rufach also possesses a School of Viticulture.

Winter schools exist in a number of centres up and down the Reichsland. They give a five-months' course for a fee of 10*s*., which is remitted in the case of needy scholars. These schools are mostly attended by peasant boys between the ages of 15 and 17, after leaving school.

There are farriery schools at Strasburg, Metz, and Mulhouse. These give a free three-months' course twice or three times a year, concluding with a qualifying examination.

The Strasburg Technical College has a good deal to do with the training of agricultural officials and inspectors.

At Colmar and Strasburg five-week courses in fruit-growing are held (gratis) for gardeners and fruit-growers. Several *Kreise* and cantons provide their officials, instructors, &c., with annual ten-day courses of instruction.

Two-day courses in fish-breeding are given by the Director of the Institute of Pisciculture at Blotzheim. They are attended by officials interested in irrigation, agricultural improvements, and forestry, and also by agricultural instructors.

Alsace contains two private Schools of Domestic Economy, subsidized by the State, and attended by peasant girls. They are situated at Marlenheim and Herlisheim.

The Colmar Experimental Station sends out lecturers to agricultural and other local societies, in addition to its own research work. Finally, special courses of lectures on vines, poultry, fish, &c., are organized from time to time as required, either by the *communes* on their own initiative, or by local societies, or by the State.

Co-operation

The co-operative movement, though it appeared early in Alsace, made little progress during the nineteenth century. Among the earliest ventures were the Co-operative Banks (1869); the Bull-keeping Association (1868); improvement societies for drainage (1857) and irrigation (1865); and the Machine Association (1868).

All this was checked by the war and the annexation. Emigration depopulated the country-side and deprived it of its best elements; the new orientation of commerce was detrimental

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to agricultural development ; and just when the country might have been beginning to recover from the effects of the annexation the agricultural depression set in. Thus, though Raiffeisen banks were instituted round Strasburg as early as 1882, their progress was negligible till 1895, when the Alsace-Lorraine branch at Strasburg was affiliated to the original society at Neuwied. There were 38 Raiffeisen banks in Alsace-Lorraine in 1884 : in 1900 the number had risen to 185 ; in 1904 to 322. At the same time the *Kreisvereine* took up co-operation and formed societies independent of the original Neuwied foundation.

Thus by the beginning of the twentieth century there were 285 Raiffeisen banks and stores dependent immediately on Strasburg and, through Strasburg, on Neuwied, and, in addition to these, a number of independent societies, handicapped by lack of co-ordination. The latter are now incorporated in the *Revisionsverband*.

After 1900 a new period of activity set in. The following organizations were now formed : first, the Union (*Landesverband* ; see above, p. 264) of *Kreisvereine*, which co-ordinated the efforts of these societies ; secondly, the *Revisionsverband* (later united with the imperial organization of the same kind), which forms a union of all the previously disconnected co-operative societies ; and, thirdly, the *Landeszentralkasse* or co-operative agricultural bank for the Reichsland as a whole.

The history of the Raiffeisen banks since 1900 appears to have been one of disaster. Owing to unequal crops and the insufficient capital of shareholders the demands on them were excessive, and their managers were in many cases ignorant of business methods and unequal to their responsibilities. The result was a series of failures which caused the loss of a million marks, a diminution of business, and a check to the foundation of new branches. The Raiffeisen organization is accordingly in the background at present, and the advance of co-operation is in the hands of the other societies. That it is advancing there is no doubt ; nor can it be denied that co-operation is the solution for many agricultural difficulties which Alsace-Lorraine shares with other countries of smallholders.

The *Revisionsverband* and other Alsace-Lorraine organizations are thus undertaking co-operative banking, insurance, provision of bulls and other breeding animals, provision of seed and manure, provision of agricultural machinery, and carrying out

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of drainage, irrigation, and other improvements. Altogether there is a highly complex organization of co-operative societies in the Reichsland, dealing with practically every aspect of agricultural work and with every kind of agricultural insurance.

Agricultural Finance

The capital vested in agriculture in the Reichsland is estimated at 90 millions sterling.[1] The liabilities amount to 10·35 millions (mortgages, 3·75 millions), which makes the net capital 79·65 millions. The liabilities are thus 12 per cent. of the total gross capital, and the mortgage debt alone over 4 per cent. In relation to the total value of the agricultural land the mortgage debt would be of course higher; but an estimate of the total value of the land is not available. It is, however, clear that the proportion of debts to capital is unduly high, and German official writers admit that no adequate means for reducing it have as yet been devised and put into operation. The small farmers of Alsace-Lorraine—especially those of Alsace—are in fact severely oppressed by debt. This affects both their land and their cattle. The latter are commonly held on the lease system (French *vente en cheptel*), which is practically universal in Lower Alsace. The stock is owned by Jews, who, if the peasant falls into arrears in payment of the hire, distrain on his other securities (bonds, title-deeds, &c.).

This system, extremely prejudicial to the prosperity of the country, was the object of a special law in 1890. This law is, however, easily evaded, and the only means of securing the peasant's position is to enable him to meet his debts. This is being done by savings banks, Raiffeisen banks, and other similar organizations. These are now in existence almost everywhere, often in association with co-operative stores and societies.

Taxes on land, houses, and effects, rates, probate duty, conveyance duty, &c., amount to about 13*s.* per hectare of agricultural or forest land yearly.

[1] It ought perhaps to be pointed out that this estimate is liable to considerable error, since it is based (1) on probate valuations, (2) on figures for a very short period (1891–4), (3) on the assumption that all property falls in once in 30 years. An estimate so reached cannot be considered accurate, but no other is available.

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Agricultural Systems

In dealing with a country where traditional methods play such a large part as they do in Alsace-Lorraine it will be convenient to summarize the chief systems employed and to explain the technical terms involved. We shall accordingly give an account of the main types of agriculture, beginning with the most primitive and 'extensive', and leading up to the most 'intensive' and highly developed methods.

Grass-farming (Weidewirtschaft)

This is a very old-established and in general highly 'extensive' system. At one time it probably occupied the greater part of Alsace-Lorraine; it is now, however, confined to the hill districts and to certain parts of the Lorraine plateau. Early in the nineteenth century large areas in the Alsatian plain were devoted to this type of farming; they took the form of commons on which village cowherds pastured the cattle of the *commune* in summer. These grass-commons have now entirely disappeared from the Alsatian plain.

In the Vosges grass-farming still flourishes. On the summits, the so-called *Hautes Chaumes*, it reigns alone. This type of farming[1] is confined to the high crystalline Vosges; the sandstone Vosges are timbered to the summit and have no high pastures, which occur as a rule only above the 1,000-metre line.

Grass-farming is also present in the Alsatian Jura; but it is here secondary to the arable-grass system, described below, and occupies a very small area.

A totally different type of grass-farming occurs in Lorraine. This is a modern development (end of the nineteenth century); it is found especially in *Kreise* Metz-land and Château-Salins. Former arable land was laid down as pasture, surrounded by wire fences, and supplied with shelters and drinking-troughs; and stock of various kinds (calves, cattle, draught-oxen, horses, &c.) grazed during the summer. Heavy soils (Keuper marls) are generally chosen; the water-supply is good, and the soil produces good pasture. The economic motives of this innovation are complex: rising agricultural wages, high price of meat, milk, and live-stock, and low price of corn all contribute. The 'parks' (as they are locally called) occur chiefly on the large

[1] For a description see below, pp. 294–6.

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consolidated farms of the Metz, Château-Salins, and Saarburg *Kreise*; but of late years the smaller farms have also been experimenting with them. It is too early to say with certainty that the experiment has proved a permanent success; but there is no doubt that much of the Lorraine plateau, with its heavy soil and high rainfall, would make excellent pasture-land; and French as well as German Lorraine has recently been moving towards a considerable extension of pasturage and a development of its cattle-breeding possibilities.

Burnt-farming (Brandwirtschaft)

This is a primitive method of agriculture, confined nowadays to very small areas in the Vosges and losing ground year by year. It is still found in the Breuschtal and Weilertal, but practically nowhere else. The evidence of field-names proves that it was once widespread, and extended not only over all the mountain districts but even in the Rhine plain.

The method consists in cutting all the broom and other shrubs on a common, stubbing up and drying the roots, collecting the whole into heaps and burning them, and then digging in the ashes. The field is then cropped for one, two, or three years with potatoes or rye, after which it lapses into pasture again for ten or twelve years.

Common pasture is often broken up and sown periodically without burning.

Arable-grass Farming (Feldgraswirtschaft)

This method consists in the alternation, at varying periods, of arable with grass (either hay or, less commonly, pasture). Its distribution is rather curious. It is confined to the hill districts and to regions bordering on them, particularly the Alsatian Jura, the Markirch and Breusch valleys in the High Vosges, the neighbourhood of Bitche, and the neighbourhood of Niederbronn. It is generally found in association with an abundant rainfall; but the rainfall of the Niederbronn district is rather low, and that of the Markirch and Breusch valleys no higher than that of their neighbours. Again it is not confined to one type of soil: in the Jura the soil is heavy loam, in the Vosges light and sandy. Again the altitude at which it is found varies a good deal; it generally occurs at a considerable elevation, but at Niederbronn it is only 600 ft. above sea-level.

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In the High Vosges on the other hand it is found at over 3,000 ft.

Farmers claim that it is a good method because the manure gets ploughed into the soil instead of remaining on the surface as in the case of permanent grass-land, and assert that they always get the finest crops of hay or corn the first year after the change. On the other hand observers report that the change to grass takes time and is not skilfully done. At first the land is often overgrown with sorrel and rib-grass ; the farmers exercise little discretion in the selection of grass-seeds ; and it may take years before a good turf is established.

Three-field System (Dreifelderwirtschaft)

This is by far the most widespread and important system in Alsace-Lorraine. It extends to more than two-thirds of the total arable in the Reichsland, and its preponderance in French Lorraine is even more overwhelming. It is almost universal all over the Lorraine plateau, with insignificant exceptions ; universal in the Sundgau ; and predominant in all the plain of Alsace except north-east of a line running from Strasburg in the direction of Saarbrücken. It is remarkable that the three-field system is entirely absent from the Vosges.

There are, however, local variations in the three-field system. In its most primitive form it involves dividing up the whole arable land of a village into three sections, of which in any given year two are cultivated and the third left fallow. The whole 'section', including of course a number of different properties, is sown with the same crop, so that there is no scope for initiative or experiment on the part of the individual proprietor, who is compelled to fall in with the practice of his village. The agricultural unit under this system (and under all the kindred systems hereafter to be described) is not the proprietor but the *commune*.

The first step away from this original phase of the system is in the direction of abolishing the fallow year. This step is now practically completed in Alsace, and in process of completion in Lorraine. Its completion depends of course on the improvement of artificial fertilization and of the rotation of crops ; and these improvements move faster in a fertile country, where agriculture is easy, than in a country of cold and ungenerous soils like Lorraine. The progressive abolition of fallow in Lorraine may be

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tested by statistics. The pure three-field system would involve 33 per cent. of fallow in proportion to the total arable surface in any given year. In 1893 the percentage (German Lorraine) was actually 15, or less than half the standard for pure three-field agriculture; in 1911 it had sunk to below 10.[1] Thus it may be said that wherever the three-field method obtains in Alsace, and also in more than two-thirds of German Lorraine, it is customary to sow 'fallow crops' in the third year, instead of leaving the land in the condition of pure fallow, as in the original three-field method. In Alsace, and especially in Lower Alsace, these 'fallow crops' are often very important, and include such cultures as hops, tobacco, and sugar-beet.

The two main crops of a three-field cycle are cereals. This means that some 67 per cent. of the whole three-field area is under cereals every year; and the result is considered unsatisfactory. In Alsace at least, there is scope for more intensive methods than this, and experts are generally agreed that it would profit both the farmers and the country if the rigour of the three-field system could be relaxed and much land now devoted to cereals were applied to industrial and forage crops, market-gardening, &c. There are tendencies in this direction in Alsace, but they act mostly upon the two-field system, where that is present; the three-field system is very tenacious and rigid. In Lorraine there is even less likelihood of improvement than in Alsace, and intensive cultivation on a large scale is unknown.

The actual working of the improved three-field system in Alsace is as follows: all over the Rhine plain south of Strasburg the land of each *commune* is laid out in three sections, of which in a given year one will produce winter grain, mainly wheat with a little rye; the second summer grain, mainly barley, perhaps some oats (or both these sections may be sown with maize, or, in the Sundgau, with winter rye); while the third will be divided into two or three sub-sections, each producing a different crop freely selected from a list containing clover, beet, potatoes, rape, tobacco, &c.

[1] 13·3 per cent. in *Kreis* Château-Salins; 10·6 and 10·5 in Saarburg and Bolchen; 9·4 in Metz-land; 8·5 in Diedenhofen-West; 7·9, 7·7, 7·0 in Saargemünd, Forbach, and Diedenhofen-Ost; 9·6 for German Lorraine as a whole (*Stat. Jahrb. für E.-L.*, 1911, p. 63). The most advanced methods thus correspond to the areas of densest rural population.

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In the Vosges valleys the rotation is less varied. In parts it is winter wheat, barley, clover or mangolds; elsewhere wheat, oats, clover; elsewhere again wheat, barley, rye and potatoes alternately.

In Lorraine the succession winter wheat, summer oats, fallow is usual. The wheat is of the red beardless variety; its place may be taken by lentils, oats, rye, lucerne, or sainfoin, but wheat is very much commoner as a winter crop than all these together. Barley sometimes takes the place of oats as a summer crop; and various fallow-crops (clover, potatoes, beet, lentils, vetches, peas, and beans, even oats or barley) are sometimes sown in part of the fallow land. Sometimes in Lorraine a regular rotation on the improved three-field system is found: e.g. such a succession as wheat, oats, peas, wheat, oats, clover (or potatoes).

It is noteworthy on the other hand that here and there in Lorraine the three-field system has been abandoned or its rigidity broken; thus the two-field system appears in a few places (see below); and all over Lorraine pasture is increasing.

Four-field, Five-field, &c., Systems (Mehrfelderwirtschaften)

These imply sowing the same section of the communal land with grain for three, four, &c., years (instead of two, as in the three-field system) followed by a year of fallow or fallow-crops. Such systems occur only here and there in Alsace-Lorraine and do not call for detailed consideration. They include such rotations as rape, wheat, rye, barley, lucerne; oats, wheat, rye, oats, fallow, wheat with a catch-crop of lucerne (both from German Lorraine).

One-field System (Einfeldwirtschaft)

Here the whole plot of land is sown with the same crop year after year. The system is unimportant in Alsace-Lorraine.

Two-field System (Zweifelderwirtschaft)

The communal land is divided into two sections, of which one in any given year is devoted to cereals and the other to fallow-crops; in the next year the position is reversed. This system is found in a large district of Lower Alsace, extending as far south as Strasburg; in the sandstone district near Forbach and

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St. Avold in Lorraine ; and sporadically throughout central Alsace, where it seems to be supplanting the three-field method. In many of the Vosges valleys a rather similar system prevails, according to which the whole communal land is sown alternately with rye and potatoes. This, however, though a two-year cycle, is not an example of the two-field system because the communal land is treated as a whole, not divided into two sections.

The two-field system appears to have originated on poor and light soils, where alternate years of ploughing and fallow were desirable, the soil not being rich enough for the two successive years' cultivation involved in the three-field system. But, though originally a less intensive system than the latter, it has become a more intensive one ; for where the three-field system allows only one-third of the land to be sown with valuable and remunerative industrial and other crops, the two-field system allows one-half. Thus the two-field system is favourable to the development of intensive agriculture.

The ordinary two-field system of Lower Alsace produces as a rule some such rotation as the following : winter grain, roots or potatoes, winter grain, roots or potatoes, winter grain, red clover. The cereals are generally winter wheat and rye, sometimes oats : the fallow-crops grown in the alternate years are potatoes, beet, carrots, rape, clover, sometimes winter rye or oats. Other typical rotations, followed in the Kochersberg, are : (1) wheat, rape, wheat, beet, barley, potatoes, barley, clover ; (2) wheat, tobacco, wheat, potatoes, barley, beet, barley, clover ; (3) wheat, sugar-beet, wheat, potatoes, wheat, beet, barley, clover.

Even in Lorraine two-field systems are occasionally found. At Magny near Metz, for instance, alternate crops of wheat and potatoes are usual. In one district of Lorraine, as mentioned above, it is universal, viz. the so-called Gries, the sandstone district near Forbach and St. Avold.

Market-Gardening

This has developed on a large scale in several parts of Alsace-Lorraine, notably near Metz, Strasburg, Colmar, Bâle, and other large towns. A distinction may be drawn between the large-scale or wholesale (commercial) market-gardening, with which we are here especially concerned, and the market-

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gardening in small plots which is found at all considerable centres of population.

Neudorf (*Kreis* Mulhouse) is a village entirely devoted to large-scale production of asparagus, potatoes, cabbages, onions, leeks, celery, and other vegetables. Large quantities of sewage from Mulhouse are used as manure ; this is pumped from barges on the canal into tank-carts.

South and south-east of Colmar the loamy plain is almost entirely devoted to this type of agriculture. The fields are intersected by water-cuts and shaded by vines and fruit-trees. All kinds of vegetables are grown ; salad is a speciality. The manure used is sewage from Colmar ; and the produce reaches many large towns of Germany and Switzerland.

Horburg, near Colmar, is celebrated for asparagus, though the soil is a heavy loam.

Schlettstadt is a considerable centre for onions, peas, &c.

Krautergersheim is the centre of a very important cabbage-growing area in *Kreis* Erstein, which supplies local *Sauerkraut* factories.

Ruprechtsau and Hördt, near Strasburg, are important centres, the former for tomatoes, beans, potatoes, &c., the latter for asparagus, to which the sandy soil is peculiarly suited.

It should be noted that vegetable-growing in Germany is systematically protected by heavy import duties.

Vegetable-growing in Lorraine is most in evidence at two centres in the suburbs of Metz : Sablon to south of the town, and Woippy to north-west. Sablon has an alluvial sandy soil, being situated at the junction of the Seille and Moselle ; it is especially suitable for asparagus, which is grown in very large quantities and brings in over £3,000 per annum. Various catch-crops—beans, peas, early potatoes,—are planted on the asparagus beds.

Woippy is a great centre of strawberry-growing. The soil is a strong and fertile Liassic loam, and the average yield amounts to about £12,500 at Woippy alone, where the beds cover 300 acres. In 1910 1,330 tons of strawberries were dispatched from Metz, over and above the quantity eaten in Metz and the neighbourhood, and that made into jam locally. The whole strawberry harvest in the Metz region in 1910 was estimated at £30,000.

Several other villages round Metz have extensive vegetable

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farms, many of which supply material for preserving-factories in the town.

Market-gardening in French Lorraine is important only in Meurthe-et-Moselle, especially round Nancy and Lunéville. This department contains 8,500 acres of market-gardens (exactly 1 per cent. of its agricultural land), producing crops to the annual value of about £650,000. In Meuse and Vosges market-gardening is less widespread (3,360 acres in each), and the relative value of the crops is greatly inferior.

Distribution of Crops

Throughout Alsace-Lorraine it is generally true that nearly half the land is arable, nearly one-third forest, and the remainder (apart from small percentages of vineyard, buildings, &c.) grass. The following table of percentages shows how closely these figures agree for the various major divisions.

	Arable.	*Grass.*	*Forest*
Lower Alsace	42	16	33
Upper Alsace	37	20	34
German Lorraine	55	12	26
Meurthe-et-Moselle	50	13	26
Meuse	47	11	30
Vosges	33	22	36

This table shows that the proportion of arable is highest on the Lorraine plateau, especially in the northern districts, the marly plains of the Lias and Keuper; lower in the Alsatian plain; lowest of all in the mountainous districts. Grass on the contrary is at its maximum in the mountains, lower in Alsace, lowest of all on the plateau, where it occupies only about a ninth of the total surface. Timber is highest in the mountains, and indeed high everywhere, but distinctly lowest on the marl plains of Lorraine, where arable is highest.

Analysis of Arable Land.[1]—It is convenient to distinguish for this purpose four groups of crops: cereals, forage plants, roots, and industrial crops. Forage plants are taken as including

[1] The reader who wishes to refer back to statistical sources such as the French *Statistique agricole* and the German *Statist. Jahrbuch für E.-L.* is warned that the groupings adopted here do not exactly correspond to either the French or the German grouping, the two systems of classification being different in many important ways, but are a compromise designed to facilitate comparison between the various districts of Alsace-Lorraine.

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(1) clover, lucerne, sainfoin, &c., (2) all kinds of pulse, whether or not these are used for feeding animals; but as excluding beet and other roots so used. 'Root' crops include (1) potatoes and other tubers, (2) roots properly so called, exclusive of sugar-beet, which is considered an industrial crop.

The following table gives the percentages of the whole arable land devoted to these groups in the year 1911:

	Lower Alsace.	*Upper Alsace.*	*German Lorraine.*	*Meurthe-et-Moselle.*	*Meuse.*	*Vosges.*
Cereals . .	51·8	56·2	60·0	58·0	60·5	51·0
Forage . .	12·4	14·9	15·0	12·1	11·3	11·5
Roots . .	30·4	26·4	14·5	11·0	10·0	17·5
Industrial crops .	3·5	0·7	0·1	0·3	0·1	
Total . .	98·1	98·2	89·6	81·4	81·9	80·0

The difference between the totals and 100 may be taken as indicating roughly the percentage of fallow in the specified year.

On inspecting this table the reader will observe that over half the arable in every district is devoted to cereals. Of the remainder about a quarter or a third is planted with forage crops, and the rest divided between root crops and fallow. It is obvious that in Alsace root crops are generally planted, while in Lorraine—especially French Lorraine—the land is left fallow. Fallow and roots between them everywhere occupy about a third of the total arable area; and the large quantity of roots grown in Alsace is produced by land which in the less fertile and agriculturally less advanced Lorraine would be fallow. The result is that in Lorraine the output of cereals enormously predominates over everything else; for of the land which is actually ploughed in any one year 65–75 per cent. is sown with cereals. In Alsace on the other hand, though cereals still outweigh all other crops put together, about one-quarter of the total arable is every year devoted to roots.

Cereals.—Further analysis confirms the first impression, that Alsace produces a much greater variety of crops than Lorraine, where the system of rotation (see above, p. 270) is very rigid and unaccommodating. Thus in the cereal group Lower Alsace devotes 37 per cent. of its cereal-producing land to wheat, 28 per cent. to barley, 15 per cent. each to rye and oats; Upper Alsace gives 33 per cent. to wheat, 24 per cent. to barley, 18 per cent. to rye, and 17 per cent. to oats. Each also grows

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a good deal of maize. In Lorraine on the other hand practically nothing but wheat (35–45 per cent.) and oats (40–50 per cent.) is grown, with a little rye here and there; that is to say, in Lorraine the rotation wheat, oats, and fallow is almost universal. It may be observed in this connexion that the great Alsatian corn-producing country is the Kochersberg, which contributes 14 per cent. of all the cereals grown in Alsace. In Lorraine the Messin, the Saulnois, and the Plain produce most cereals.

The very high proportion of arable devoted to cereals has been severely criticized. It is pointed out that the average crop of grain for the whole Reichsland, after deducting seed-corn, is 250,000 tons, whereas the local demand is 328,000 tons or thereabouts. This means that one-quarter of the total demand must in any case be supplied by imports (more exactly, 50 per cent. in Upper Alsace, 29 per cent. in Lower Alsace, 5·5 per cent. in German Lorraine). Now this extra 78,000 tons could not be produced by any additional effort; the cereal-producing capacity of the land is already strained to its utmost. It would be better therefore to decrease the output and increase the imports, employing the land thus set at liberty in fruit-farming, intensive cultivation, and stock-breeding, all of which are much more profitable than the production of grain.

The old native Alsatian wheats are hardy, but their yield is poor, they have little power of resisting disease and their storage qualities are bad. Experiments at improving the type in these respects have been extensively carried out, but little general improvement in the average quality is yet visible, owing (it is said) to the conservatism of the small farmer. German authorities deplore that, whereas two generations ago Alsace was ahead of the South German States in the yield and quality of her wheat, she is now behind them. The average yield is 13 cwt. per acre in Upper Alsace, 13·6 in Lower Alsace, 12 in German Lorraine.

Barley is a success in Alsace, and is held increasingly in esteem. The native varieties are good and capable of improvement. The yield in Alsace is 14·8 cwt. per acre. It is hardly ever grown in Lorraine.

Rye grows well in the mountains and the light alluvial soils of the plain. It is on the increase in Alsace, and is grown for the market. It is little grown in Lorraine, except in the sandstone districts; the inhabitants prefer wheaten bread.

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Oats are coming more and more into favour, owing to the great rise in price. The Sundgau and Lorraine are better for this crop than Alsace. The native varieties seem best suited to local conditions.

Maize is on the increase in Alsace ; it is hardly ever grown in Lorraine. Some varieties will ripen locally, and these are used as grain ; others will not, and are used as green fodder. Maize is especially used for fattening geese ; and local Alsatian produce is preferred to imported grain for this purpose.

Forage.—Of the forage group only about one-tenth to one-twentieth consists of pulse, which is grown mostly in Alsace. Clover and lucerne are the chief crops : in Lower Alsace 62 per cent. of the whole group is clover, 31 per cent. lucerne ; in Upper Alsace 45 per cent. clover, 35 per cent. lucerne. The chief districts are the Kochersberg in the north and the neighbourhoods of Colmar and Mulhouse farther south. In Lorraine lucerne takes precedence of clover, and sainfoin becomes an important crop, especially on the light Jurassic soils of the west ; clover is mostly grown in the heavier soils of the Messin, the Saulnois, and the Plain.

Roots.—Potatoes have long been one of the main foods of Alsace-Lorraine. They are an important crop in the Alsatian plain and in the mountain districts ; throughout the Vosges valleys they are a staple. In Alsace they occupy 16 per cent. (one-sixth) of the whole arable. The proportion is practically identical in Upper and Lower Alsace ; but in Upper Alsace they are grown more in the mountain valleys, in Lower Alsace more in the sandy soils of the plain. In the department of the Vosges the area is almost as large (15 per cent. of all arable) ; this is due to the prevalence of potatoes in the mountains. On the Lorraine plateau they are much less common ; they occupy 10 per cent. of the arable in German Lorraine, 7·3 in Meurthe-et-Moselle, and 7 in Meuse. Of other crops classified as roots none are of any importance except beet, grown as fodder. This crop is found everywhere ; but it is much commoner in Alsace than in Lorraine (10 and 8·5 per cent. of all arable in Lower and Upper Alsace ; 4 to 1 per cent. in Lorraine) and commoner in German than in French Lorraine. In fact the figures for all kinds of roots especially demonstrate the greater flexibility of agriculture in the Reichsland as a whole, and especially in Alsace.

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Industrial Crops.—As the table shows, these are of very small importance. There is a very little sugar-beet in Lower Alsace and Meuse ; some tobacco in Lower Alsace and Meurthe-et-Moselle ; and hops in several parts of the country. Of the figures given for industrial crops, over three-quarters applies to the last-named. Rape and hemp were once a good deal grown in Alsace ; but they are declining under the influence of petroleum and cotton, and little of either is now grown, except to satisfy small local demands.

It is worth remarking that the only district where industrial crops are of primary importance is a region of Lower Alsace, extending north and south to the frontiers of the Palatinate and Upper Alsace, and bounded on the west by a line running through Weissenburg, Ingweiler, and Wasselonne. In this area the soil is very varied : it consists first of detritus containing elements of granite and sandstone, and secondly of loess. This, together with the plentiful supply of underground water, gives conditions highly favourable to industrial crops. Even here, however, industrial crops are declining. In Lower Alsace they occupied 9 per cent. of all arable and garden land in 1866 ; since then they have decreased by two-thirds. Hops and tobacco (to which separate sections are devoted below) are the only two which by now retain any importance.

Viticulture

In proportion to its area the Reichsland is the chief wine-producing district of Germany.[1] The vine is its principal culture, and one for which Alsace at least has been famous for over a thousand years. The Alsatian foothills are the centre of vine-growing in the province, and here, with soil and climate highly favourable, the industry is almost as important as on the Côte-d'Or ; on the Lorraine plateau the vine is widespread but less profitable and more exposed to hostile influences.

Distribution

Throughout Alsace-Lorraine the vine flourishes best on limestone slopes facing east and south-east. These are to be found,

[1] The German Empire as a whole has 135,210 hectares of vineyards, or 0·25 per cent. of its surface, producing 4·5 million hectolitres per annum. The Reichsland has 33,000 hectares, or 2·3 of its total surface (ten times as much in proportion), producing 1·4 million hectolitres. France has 1,652,100 hectares (3 per cent. of total surface), producing 45 million hectolitres.

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first, in the Vosges foothills, composed principally of Jurassic and Tertiary formations; and secondly, in the oolitic escarpments of the Lorraine plateau. The limestone ensures a dry and warm soil, well drained and easily penetrated by the vine roots; an eastern aspect shelters it from the moisture-laden winds and noticeably reduces rainfall, while attracting the morning sun.

These conditions all attain a maximum in the Vosges foothills. Here a whole district lies in the 'rain-shadow' of the Vosges, and has therefore a quite exceptionally low rainfall (20 in.); the district is low-lying and warm, while the foothills are raised above the mists and frosts of the plain; south-eastern slopes, giving a maximum of sunshine, are normal; and the soil is a combination of limestone and loess, the latter easily drained and cultivated as well as being highly fertile.

The foothills thus form a continuous belt of rich vineyard country, beginning at Thann and extending to Marlenheim. This belt, the ancient site of her greatest and most remunerative industry, is (as we have already pointed out, pp. 35, 40) the political and economic backbone of Alsace. Flourishing towns and large villages succeed each other at short intervals; communications are easy; agriculture and industry thrive; and the tradition of prosperity founded on the vineyard goes back unbroken to the days of the Frankish kingdom.

The vineyards of the foothills tend to spread both down into the plain and up along the Vosges valleys; they also extend, in less continuous formation, northward towards Niederbronn and Weissenburg. Their invasion of the plain is restricted to a very few places, notably Colmar and Schlettstadt. Some of the Vosges valleys have considerable vineyards, notably the Münstertal, the Weisstal, and the Blumental near Gebweiler; there are three or four wine-growing villages in the Dollertal, and a good many in the Thur valley, as far up as Weiler. The Liepvrette and Breusch valleys and the Weilertal grow very little wine. The vineyards of Lower Alsace are less important; they exist, none the less, in the Kochersberg, in the Mossig and Wangenbach valleys, on both sides of the Zorn, sparsely in the Moder and Zinsel valleys, and in larger numbers again round Weissenburg.

Alsace also contains a wine-growing area of minor importance in the Sundgau. Here vineyards occur in the Ill valley from

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Altkirch down to Mulhouse, and again along the eastern slope of the Sundgau plateau from Mulhouse south-eastward to Bâle.

The conditions in Lorraine are nowhere quite so favourable as in the Alsatian foothills. The absolute altitude is greater, the degree of shelter from rain and wind much less. But in spite of these disadvantages there is an old-established and successful viticulture in the Moselle valley, beginning at Frouard (mouth of the Meurthe) and extending down-stream on the oolite and marl slopes on both banks (especially the left) past Metz to the Luxemburg frontier. The vines of the Moselle are of course famous, but the well-known Moselle vintages are not produced as far up-stream as Lorraine ; they grow in the warm and very sheltered valley between Trier and Coblenz. Here at Metz, however, vines have been grown since even before the Roman occupation, and much passable wine is still produced ; the whole city is surrounded by vineyards.

The eastern face of the Côtes de Meuse, together with their outliers, repeats at a greater elevation some features of the Moselle valley. Dry limestone slopes give protection from westerly winds and catch the sun ; and here again vineyards are found on all suitably exposed slopes from Dun to Toul and beyond.

Apart from these main belts of wine-country in Lorraine there are outlying districts of secondary importance. One is in the Saulnois, along the Seille valley and on the hills near Dieuze and Château-Salins ; another in the Barrois, on the limestone slopes of the Ornain and other streams ; a third, famous for the high quality of its wines, on the Rupt-de-Mad round Thiaucourt. There are also considerable numbers of vineyards scattered over most of the Lorraine plateau between Metz and Épinal.

Statistics of Distribution.—The following are the most recent figures available for the details of distribution. The German figures refer to 1913, the French to 1911.

Upper Alsace	24,300	acres of productive	vineyard
Lower Alsace	31,800	,,	,,
German Lorraine	10,700	,,	,,
Dept. Meurthe-et-Moselle	21,300	,,	,,
Dept. Meuse	11,750	,,	,,
Dept. Vosges	8,625	,,	,,
Total	108,475	,,	,,

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The total area of vineyards is thus over 160 square miles, of which 85 are in Alsace, 16 in German Lorraine, and 65 in French Lorraine.

Of all the *communes* in Alsace (946), over two-thirds (653) possess vineyards : but in many cases these are very unimportant. Rather over one-eighth of the total number (123) may, however, be described as exclusively or primarily vine-growing areas, as possessing over 50 hectares (123·5 acres) of vineyard, while one-thirteenth possess over 100 hectares. The *communes* standing at the head of the list are Colmar (500) Oberehnheim (500), Epfig (495), Türkheim (464), and Dambach (450) ; the figures give the hectares actually producing wine in the year 1898. It must be observed that this figure is subject to considerable fluctuation, rising after good years and falling after bad ; these variations are considered below (p. 285). With very few exceptions, the *communes* having over 50 hectares of vineyard are situated in the foothills.

In considering the density of vineyards by *Kreise*, Schlettstadt comes first with 11,850 acres ; Rappoltsweiler and Molsheim have 9,640 and 8,400 ; Colmar, 7,160 ; Strasburg-land and Gebweiler, 5,450 ; Zabern, 3,700 ; Erstein, 2,500 ; the rest, under 2,500 acres. In extreme cases like Rappoltsweiler the vineyard area amounts to as much as 18 per cent. of the total cultivated land.

In German Lorraine half the total acreage of vineyard occurs in Metz rural *Kreis*, and over a quarter in Château-Salins. The insignificant remainder is almost entirely situated in Diedenhofen-West. Bolchen and Forbach have under 2 per cent. of the total, and Saarburg and Saargemünd practically none. There are in fact no vines in Lorraine east of the Saar (though some occur near Saarunion, in Alsace), and none in the north-eastern part of the province. The German Government has made great efforts to extend viticulture on the Lorraine plateau, and actually did considerably increase the area of vineyards in the Seille valley, experimenting at the same time with new sites farther north (St. Avold, Rixingen, &c.).

In fact Vic (Saulnois) stood, by 1898, at the head of the vineyard *communes* of German Lorraine, with 670 acres. Only 8 *communes* (Vic, Ars, Ancy, Novéant, Scy, Wallingen, Marange, and Thionville) had over 250 acres, and only 32 had over 125. Five of these predominantly wine-growing *communes* are in the Seille valley, the rest all on the Moselle.

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In French Lorraine the department of Meurthe-et-Moselle contains half the total acreage of vineyards, or twice as much as in all German Lorraine. Meurthe-et-Moselle is in fact one of the major wine-growing departments of France. Its vineyards are densely concentrated along the Moselle below Frouard, on the hills round Toul, and round Thiaucourt ; they are also freely scattered over suitable slopes on the plateau round Lunéville.

The department of Meuse contains about the same area of vineyards as all German Lorraine. They are situated in two districts : on the Côtes de Meuse and round Bar-le-Duc.

The vineyards of the Vosges department are a good deal smaller in extent and of less importance.

Methods

The old Alsatian method was admirably designed to secure a large yield of good grapes. The vines were grafted on from one to three limbs of the stock and trained downwards on stakes, then being tied to the stock. This method had the disadvantage of being laborious and expensive, and a simplification of it (Oberlin's wire system) has come into widespread use during the last 20 or 30 years. The most recent method (the so-called ' cordon ' method) entirely dispenses with wooden props ; the vines are lower, and are trained on wire alone. This method costs less than half as much as the old system, and lets in plenty of light and air, thus removing one cause of disease.

Local variations in this practice occur here and there. Thus in the neighbourhood of Thann the vines are sometimes trained on horizontal laths ; at Weissenburg the pergola method is in use, the pergolas being made of horizontal lattice-work.

In some parts of Lorraine the so-called ' cradle ' method is in vogue. The vines from one stock (up to 12 in number) are spread out horizontally and then trained up separate poles. This is a costly system, but produces great quantities of grapes. The cordon method is also making headway, especially in the Messin ; but the great majority of vineyards are planted *en foule* (i. e. irregularly), kept low and trained in cones. They run about 16,000–20,000 per acre.

The average size of plots is small (the following figures apply to the Reichsland only). The average is almost exactly 1 acre. Of the 81,000 plots 23 per cent. are under ¼ acre ; 65 per cent.

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between ¼ and 2½ acres ; only 7 per cent. over 2½ acres. The plots under 2½ acres include 65 per cent. of the whole vineyard surface. It is remarkable that one-third of the wine-growers entered a non-agricultural pursuit as their chief occupation at the last census ; the smaller vineyards are in fact often cultivated by persons engaged in industry or trade.

The vineyards of Alsace-Lorraine have been very severely damaged by the phylloxera. Some 600 acres of vines have been destroyed by it since its first appearance, and students of agricultural conditions consider the present situation serious enough to demand a total replanting of large areas with American vines, and a new and closer organization of all owners and tenants of vineyards for systematic research into new methods of prevention. A good deal has already been done towards isolating infected areas.

Produce

The Alsatian wines are for the most part white. They have a rather high alcoholic content and keep well; forty-year-old wine can often be found in good condition. They also travel well, and are much exported, though seldom under their own name ; they are sold as hocks and moselles.

Of the high-class white wines the best come from Reichenweier and Rappoltsweiler : the former producing Riesling, Tokay, and Muscatel, the latter possessing the finest vineyard in Alsace, the Zahnacker, little over an acre in extent but planted with a peculiar mixture of very old vines which blend into a distinctive and unsurpassed wine. Other especially good vineyards at Rappoltsweiler produce high-class Riesling and Tokay.

After these the best vineyards in Alsace for white wine are : Thann, with steep south slopes but few first-class vines, producing the vintage known as Rangen ; Gebweiler, producing the so-called Kitterle ; and Türkheim, where the ' Brand ' is grown on an exceptionally well-situated and well-sheltered slope. These three varieties are famous throughout Alsace, though the habit of exporting Alsatian wines under a false name denies to them a wider celebrity. There is no doubt that the output of first-class wine could be increased if the market demanded it, by planting none but the choicest varieties on the most favourable slopes. At present some of the best sites are wasted on inferior

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growths. The high-class wines, it will be observed, are mostly grown in Upper Alsace ; but there are one or two famous vintages in Lower Alsace, notably the Riesling of Wolsheim, which is nearly as good as the similar wines of Upper Alsace.

With these and a few other exceptions the wines produced in Alsace are *ordinaires*, or table-wines as they are called in Germany. These of course are of very varying qualities : many towns and villages pride themselves greatly on the excellence of their *ordinaires*.

Red wine is grown in Alsace at about a dozen places : Türkheim, Kaysersberg, Reichenweier, Rappoltsweiler, Rodern, St. Pilt, Ottrott, and St. Leonard are the most important.

The wines of Lorraine are mostly red. They are on the whole inferior to those of Alsace ; this is especially true of German Lorraine, where very little high-class wine is grown. Near Sierck white wine is produced ; in the Barrois the well-known *vin gris* ; elsewhere red is the rule. The only Lorraine wine that has a high reputation for its quality is that of Thiaucourt, which sells in the towns of Lorraine at a price equal to that of good Bordeaux and Burgundies. Most of the Lorraine wine is rather sour and second-rate *ordinaire*, and is consumed in the country or exported very short distances, e. g. from the Moselle valley to the Vosges. The Sierck white wines are a good deal drunk in Germany as ' Moselle '. On the whole viticulture in Lorraine meets with only moderate success ; the country stands high and is much exposed ; late frosts are common ; the rainfall is considerable ; and labour is scarce.

The output of wine varies enormously from year to year, both in quantity and in quality ; and average figures are of very slight value. But it may be remarked that the average output of the Reichsland is about one to one-and-a-half million hectolitres (say 20–30 million gallons), which works out at 350–450 gallons per acre. But some vineyards grow for quantity, and average as much as 950 or 1,000 gallons per acre, while others growing for quality average 150 gallons per acre, and never in the best years produce more than 350 or thereabouts.

The prices of wine vary from year to year and from place to place as much as the quantities produced. Taking the prices for the whole Reichsland, 29 marks per hectolitre (1*s.* 4*d.* per gallon) is the average for 20 years ; in particular years it may

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rise to 40 marks or fall to 18. Locally still greater variations occur, especially in Alsace ; in Lorraine prices are fairly steady. Generally speaking, a high-class vintage wine ready for bottling fetches 3*s*. to 5*s*. per gallon ; a good *ordinaire* 1*s*. 6*d*. to 2*s*.

The great demand for champagne in Germany has given rise to an extensive industry in Alsace-Lorraine, where so-called champagne can be made for the German market without paying import duties. As is well known, champagne of a sort can be made out of practically anything ; and a great variety of sorts is produced by these factories. The better qualities, however, made of such good material as the Zahnacker of Rappoltsweiler, or of raw material imported from Reims, are very good wines. Many of the Lorraine wines are very suitable for conversion into 'champagne' on account of their high content of carbonic acid. In 1912 there were 30 'champagne' factories in the Reichsland, which produced 2 million bottles of wine ; and 500,000 gallons of unfermented juice were sent from Lorraine to factories in various parts of Germany for the same purpose.

History

The vine was introduced into Alsace-Lorraine by Greek influence through Marseilles, before Julius Caesar conquered the country. Under the Roman Empire viticulture flourished, and, though damaged by the barbarian invasions, rapidly recovered and enjoyed a high degree of prosperity under the Frankish kings. By the seventh and eighth centuries many of the modern wine-growing centres of Alsace-Lorraine are known to have existed, and from this time the kings, nobles, and monasteries devoted great attention to their vineyards. These were at first common land, but fell by degrees into the hands of those who were rich enough to command labour, though small plots of vineyard owned by burghers existed from an early date. But for the most part small vineyards came into being only about the eleventh century, partly through the institution of *métayage*. In the twelfth and thirteenth centuries a great expansion of vineyard set in, at the expense first of forest and later of arable. By the fourteenth century the distribution of vineyard stood very much as it stands now ; and the vintners' guilds were an important feature of Alsatian society from this date down to the eighteenth century.

The industrialization of the country and the improvement of

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communications have left their mark on the vineyards. The price of wine has been lowered by the competition of heavier south French, Spanish, and Italian wines ; labour has become less easy to find, both in Lorraine, where the rural population is everywhere thin, and in Alsace, where it has declined since the German occupation ; the phylloxera (since 1876) has done immense damage ; and these factors have not been counterbalanced even by the increased local demand and the increased export to Germany.

The result is a certain depression in the industry as a whole.

Hop-Growing

Hops were introduced into Lower Alsace in 1805, and began at once to take an important place in Alsatian agriculture. Their cultivation developed rapidly on the sandy soils which till then had been devoted to madder, a plant passing out of favour in Alsace at that time owing to the competition of southern France. In 1852 there were 1,150 acres of hops in Lower Alsace ; in 1866, 3,000 ; in 1904, 9,150.

In Lorraine hops play a less important part. Round Vic and Château-Salins they are a good deal grown ; also on the sandy soils of the Forbach–St. Avold district ; and in French Lorraine only in the department of Meurthe-et-Moselle (in the southern Haye, round Nancy, at Gerbéviller, and in the Vezouse valley, &c.).

The total area in 1911 was as follows :

	Acres.
Upper Alsace	220
Lower Alsace	8,950
German Lorraine	575
Meurthe-et-Moselle	1,370
Meuse	—
Vosges	2
Total	11,117

These areas vary a good deal from time to time. The very rapid increase of the Alsatian figures stopped in 1871, when the annexation checked the prosperity of the trade by exposing it to Bavarian and other German competition ; but after about 1898 it began to recover, after reaching the minimum figure of 8,800 acres for Lower Alsace. The area in French Lorraine is tolerably constant, with a tendency to decline.

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The amount and value of the crop vary enormously. Thus in Meurthe-et-Moselle, in four successive years, the weight of the crop was 7·2, 1·2, 4·8, and 1·6 cwt. per acre, and the value respectively £2 16*s.*, £10, £6 8*s.*, and £21 per cwt. In Alsace the prices are generally higher; but they sank during the eighties to £1 and less, while other parts of Germany were getting much better prices—a fact which German authorities ascribe to the great emigrations which followed the annexation and especially affected the hop-growing districts. In the nineties, before the trade began to improve again, the ruling prices were £2–3. After this period improvements set in: kiln-drying was substituted for open-air drying; wire supports were utilized instead of poles; artificial manure was introduced; and a systematic campaign against disease was set on foot. The average value of the crop has risen in consequence of new care in selecting varieties, and the hop industry is flourishing once more, though at present it shows signs of shifting its centre from Hagenau to the neighbourhood of Strasburg.

In 1907 the Reichsland produced exactly one-fifth of the whole German output at an average rate of 20·8 cwt. per hectare, this figure being rather above the average for the Alsatian hop-fields. French Lorraine produces from a tenth to a fifth of the total French crop; the prices fetched by Lorraine hops are almost always above the average price for the French crop.

The Reichsland consumes only about one-tenth of its output in a normal year. Twice that amount is exported to Belgium; small quantities go to France and England, and the remainder to Germany. These proportions of course vary widely according to the year.

The centre of Alsatian hop-growing is at Hagenau. *Kreis* Hagenau alone has nearly 5,000 acres of hops, or 55 per cent. of the total area in Lower Alsace; and Hagenau and Bischweiler are important hop-markets and surrounded by hop-fields. All Lower Alsace from Zabern to Weissenburg is much occupied with this crop, as is also the neighbourhood of Strasburg. Other centres are Molsheim, Erstein, Barr, Schlettstadt, Rappoltsweiler, and Colmar; but south of this point hops entirely cease except for a few at Neu Breisach. It is thus a characteristically Lower Alsatian product.

Experiments have now demonstrated that the old-established

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varieties of hops long grown in Alsace-Lorraine are in the long run more profitable, because more adapted to the local conditions, than 'superior' varieties imported from Bavaria and Bohemia.

Tobacco

The growing of tobacco was first undertaken in Alsace as early as 1620, when it was introduced at the Englischer Hof at Strasburg. It came at once into favour, and was widely cultivated in Lower Alsace and sold all over Europe, especially in Holland, where it competed successfully with American tobacco. By the end of the seventeenth century Alsace was producing 50,000 cwt. of leaf; by 1718, 80,000 cwt. Strasburg alone had 72 factories employing 8,000 hands.

With the institution of the State monopoly in 1811 arose a new emphasis on quality at the expense of quantity. At the same time a steady market was assured; and the acreage of tobacco in fact continued to rise from 10,000 acres in 1808 to 18,000 in 1860.[1] This was its maximum; it had apparently declined to 12,850 acres by 1866, and after the war it diminished by leaps and bounds (1872, 8,650 acres; 1882, 7,400; 1892, 3,070). After about 1890 a slight improvement set in: the downward movement was checked and even reversed; in 1912 the acreage was 3,900. This figure includes nearly 2,500 acres in *Kreis* Schlettstadt, 940 in Hagenau, 395 in Strasburg, and small quantities in Lorraine.

The drop, it will be observed, set in before the annexation. But the decay of the industry was greatly accelerated by the events of 1871. The Alsatian grower now came into competition with the growers of Baden, the Palatinate, and other German States, and suffered in consequence very severely.

Tobacco is an exacting crop: it is grown only on very good soils and is then generally followed by a long series of other crops. This is controlled by the *Tabakbauverein*. The land selected is generally a sandy loam.

[1] An official publication, *Das Reichsland E.-L.* (vol. i, p. 177), gives the area of tobacco in 1870 as 12,000 hectares (30,000 acres). This is certainly wrong; no other authority gives any such area. It is quite certain that the area in 1860 was under 18,000 acres and in 1872 under 8,650 (for the latter figure see *Stat. Jahrb. für E.-L.* 1911, p. 70). The compiler in *Das Reichsland E.-L.* appears to have confused the number of tobacco-planters (12,562 in 1872) with the number of hectares planted with tobacco.

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The gross value of the crop is £12–25 per acre. One-third of the crop is bought up by the *Tabakbauverein*; the remainder is sold to agents and manufacturers in Alsace-Lorraine, Baden, Württemberg, and the Palatinate, small quantities being exported to Switzerland and other States. The average price is £30–40 per ton.

The recovery—at best only partial—of the industry since 1890 is ascribed by German writers to the efforts of the German government and of the *Tabakbauverein*, which have spared no pains to improve the selection of varieties, methods of planting and drying, and care of the crop in general.

Fruit-Growing

The warm and sheltered situation of Alsace makes it a good country for fruit-trees; and it has in fact a number of trees relative to its area surpassed among German States by Saxony alone. The principal regions of fruit-culture in the Alsatian plain are the extreme north (Weissenburg and Hagenau) and the extreme south (Sundgau). The wine-growing areas also contain large numbers of fruit-trees, which are accordingly found in the Vosges foothills and on the slopes of their valleys; in the Moselle valley from Frouard to Sierck; in the Messin (famous for its mirabelle plums); and freely scattered over the Lorraine plateau.

In the Alsatian plain it is usual to grow small trees, which are left in place for only 6 to 9 years in a plot rented for the purpose; the land at the end of this period is considered exhausted so far as fruit-growing is concerned, and is ploughed up, the tenant being responsible for clearing it of trees before his lease expires. After ten years or so the plot is considered ready for another term of fruit-growing. In Lorraine and the hill districts permanent orchards are on the whole commoner than this method.

The commonest fruits all over Alsace-Lorraine are apples, pears, plums, and cherries. Thus in Alsace there are 1·8 million apple and pear-trees; 2·3 million plum-trees; 0·65 million cherry-trees (census of 1900). And in French Lorraine the yearly apple and pear crop amounts to some 67,000 cwt. with an aggregate value of £12,000, of which one-fifth consisted of cider-apples chiefly grown in Meuse. Meurthe-et-Moselle is up to the average of French apple-growing departments. For

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cherries and plums on the other hand Lorraine is distinctly above the average; the cherry crop in French Lorraine is worth £23,000 and the plum crop as much as £70,000.

Other fruits, however, are better represented in Alsace than in Lorraine. Peaches and apricots, even almonds, grow well in suitable situations throughout Alsace (number of peach and apricot-trees, 190,000), whereas in Lorraine the crop of peaches is small and that of apricots insignificant.

Alsace had for some time an Imperial School of Fruit-Growing (at Brumath); but this was abandoned in favour of courses of lectures and practical work. These courses are given at Strasburg and Colmar; they last five weeks, but there are other shorter courses for travelling instructors and inspectors. German Lorraine has its fruit-growing institute at St. Avold, which sends out travelling instructors.

Alsace has several nurseries for fruit-trees, of which Bollweiler is the largest, oldest, and most important. It occupies 170 acres, and exports fruit-trees to all parts of Europe.

Live-Stock

The total number of farm animals (horses, donkeys, cattle, sheep, pigs, and goats) in Alsace-Lorraine is 2·16 million, which works out at about 105 per square kilometre of agricultural land. This average, however, varies widely in the different districts. Lower Alsace has the highest figure for live-stock (171 per sq. km.); next comes German Lorraine (133); next Upper Alsace (121); Meurthe-et-Moselle, Vosges, and Meuse (80, 79, 77) are all about equal and have little more than half the head of live-stock that the German provinces possess. This is perhaps partly, but not entirely, due to the energetic agricultural policy of the German Government; for the live-stock of Alsace and German Lorraine has not very greatly multiplied since the annexation. The number of horses and donkeys is steady; cattle have increased 23 per cent.; sheep have fallen 55 per cent.; goats have risen 10 per cent. The number of pigs has indeed doubled: but this is the only striking augmentation. The real reasons for the superior number of live-stock in the Reichsland are to be found in the superior fertility of the soil and density of the population, and the consequent higher development of agriculture. Thus, when the head of live-stock

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is expressed in terms of its ratio to the population, the disparity no longer exists, and the Reichsland is superior to French Lorraine in pigs only.

Horses

Horses are relatively common all over Alsace-Lorraine, varying from 10 to 17 per square kilometre of agricultural land. Relatively to the population they are twice as common in Lorraine as in Alsace ; this is because the horse is habitually used for ploughing on the heavy soils of the Lorraine plateau, and large teams are required. In many Lorraine farms the stable is the most important building, and a large proportion of the farmer's entire capital consists of horseflesh. This is said to be costly and wasteful ; but it is encouraged by the high prices paid for three-year-olds in Germany, which makes it very profitable to breed horses for the German market. This is in fact much done in Lower Alsace and German Lorraine. All over Alsace, however, horse-breeding is on the decline, and the number of horses fell by 17 per cent. between 1862 and 1911; but in the figures for the entire Reichsland this is compensated by a decided and steady increase in the figures for German Lorraine. The leading authority on Alsatian agriculture considers this decline a healthy symptom, since it demonstrates an increasing displacement of horse-power by cattle-power and a consequent cheapening of all agricultural work. 'The economic error of many small-holders', he remarks, 'was, and still is, a too extensive use of horses for agricultural work. That the present proportion of horses is still excessive is shown by comparing Alsace with other German States whose agricultural conditions are similar. Thus in 1900 Alsace had 8·2 horses per agricultural square kilometre, Baden 5·0, Württemberg 5·7, Bavaria 5·1, Hessen 7·7, German Empire 7·8.'[1] It would appear to follow that the increase of horse-breeding in German Lorraine is to be deprecated ; but as a matter of fact this increase is due to the demands of the German market, and has been brought about by the agency of the most progressive farmers.

In the Reichsland generally the French authorities aimed at producing a good cavalry charger ; but the German policy is the reverse, namely to neglect thoroughbreds and to concen-

[1] Thisse, *Entwicklung d. elsäss. Landwirtschaft*, pp. 75–6.

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trate on shire horses. The Anglo-Norman sires, which were once in favour, have been almost entirely ousted by Ardennes, Percheron, and Boulonnais stallions. Recent additions to the imperial stud-farm at Strasburg have been drawn almost entirely from the Ardennes breed. The German Government has made considerable efforts to encourage breeding from the best stocks : stallions are owned by the State or sold at reduced rates to breeders, grants and prizes are awarded for horse-breeding, and local associations have been formed.

A few local breeds of horse may still be seen. The old Lorraine horse is heavy and clumsy, but the original stock is seldom found in an unimproved state. The Schlettstadt horse is a small hardy animal, still seen in the Rhine plain round Schlettstadt ; and the Delsberger strain still exists in the Sundgau and Jura, though it is rapidly disappearing.

Cattle

Alike in Alsace and in all parts of Lorraine, cattle-breeding is an important source of wealth. The figures for cattle are very high, varying from 25 per agricultural square kilometre in Meuse and Meurthe-et-Moselle to three times that density in Lower Alsace.

Throughout Alsace and, to a less extent, in Lorraine a very striking improvement in cattle-breeding conditions had taken place in the last two generations. Not only has the number of cattle increased (notably in the Kochersberg, the Hagenau region, and the Sundgau), but the stock has been much improved. At present the number of cattle in proportion to the population is highest in the Sundgau (Altkirch, 73 cattle per 100 population), Weissenburg region (60 per 100), and Kochersberg (43 and 50 per 100 in Strasburg and Zabern respectively). On the whole Lower Alsace has far more cattle than Upper Alsace whether reckoned per agricultural square kilometre (76 against 61) or per cent. of the population (33 against 25). In fact all the agricultural regions of Lower Alsace have many cattle, whereas in Upper Alsace they are nowhere very numerous except in the Sundgau.

In German Lorraine the number varies greatly from one district to another. In relation to the population cattle are numerous (67 per 100) in Château-Salins, and tolerably so in

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Bolchen (58) and Saarburg (47); in relation to the agricultural surface they are decidedly less numerous than in Alsace.

The chief strains of cattle are the native Alsatian speckled, the black and white Vosges, the East Frisian breed in German Lorraine, and the shorthorn in French Lorraine.

The native breed of the Alsatian plain is a smallish medium-sized, red and white speckled animal. It is a useful all-round breed both for milking and for draught work; in its unimproved state the average cow weighed not more than 660 lb. and gave a small yield of milk, but the breed has been improved by crossing with the Simmental and Baden strains, and the cow now weighs more like 900 lb. and gives much more milk, as well as being a more powerful draught animal. This breed—the improved Alsatian—is now to be seen all over the Rhine plain as well as in parts of Lorraine, and accounts for three-quarters of all the cattle in the Reichsland. The improvements in the stock have been most successful in the Kochersberg and the extreme north of Alsace.

The Vosges cattle are a small, hardy race of light build, specially adapted to the conditions of mountain pastures. This stock has existed from time immemorial in the Vosges; its history is entirely obscure. It extends northwards to the neighbourhood of Lörchingen in *Kreis* Saarburg, and southward to the Thur valley (*Kreis* Thann), its chief centres being the Breusch valley, the Weilertal, and all the valleys of the southern Vosges. The main peculiarities of the Vosges pastures are their exposed situation and the poor, heathy nature of the flora, the soil being too poor and lacking in lime to produce rich grass like that of the Swiss alps. Cattle of the Swiss breeds are accordingly unable to thrive on the greatly inferior Vosges pastures, and attempts to improve the local breed by Swiss blood have resulted in complete failure. It is now recognized that the local Vosges cattle cannot well be improved, and may easily deteriorate; in consequence the efforts of breeders are directed to keeping the strain pure and excluding all foreign blood.

The average weight of the Vosges cow varies from 700 to 1,000 lb., according to the local conditions; but it is said that the stock could be much improved by more careful handling, as at present heifers are used for breeding too young, the animals are sent too soon to work and to the poorer pastures, and there

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is no careful selection of the best specimens for breeding. Artificial food is lacking, and there are too many cows to each bull. The animals are kept all winter in badly constructed stalls that are too small for them.

These conditions of course vary from place to place. In the Münstertal, the chief dairy-farming centre of the Vosges, they are at their best: the cattle are here better housed and fed, and are in consequence stronger and healthier beasts.

In general a Vosges cow weighing 800–1,000 lb. will give 300 to 480 gallons of milk per annum, and its qualities both as a draught animal and for slaughter are distinctly good. These animals are, for instance, successfully employed in hauling timber.

There are still certain parts of the Vosges where the Vosges breed is not found, its place being taken by an inferior stock, the outcome of haphazard cross-breeding from every kind of race. This is reported as leading to good results here and there; but in general it would appear that the pure-bred Vosges would be preferable.

The cattle-farming of the *Hautes Chaumes* is a well-known and picturesque feature of life in the Vosges. The high pastures which cover all the summits of the crystalline Vosges[1] are dotted with chalets, locally known as *marcairies* or *Melkereien* in which the *marcaires* (*Melker*) live during the summer months and occupy themselves making Münster and Gruyère cheese while the cattle graze the pastures. The quality of the pasture is capable of decided improvement by manuring; it is found that the flora of the manured parts (known as *Wasen*) differs widely from that of the remainder, and is of greater nutritive value.

The pastures and chalets mostly belong to the *communes*, and are leased by tender to the *marcaires*. The average rent paid for a chalet and pasture is £25–80 per annum, and this includes a licence to use the chalet as an inn. The *marcaire* sometimes keeps his own cows, sometimes other people's; in the latter case he pays hire for them if they are milking, and receives a fee for grazing them if they are not in milk. The milk is his property. The 20th of May is the traditional date for going up to the *Hautes Chaumes*, and the return generally takes place about the 1st of October. For the use of a good

[1] See above, pp. 25, 268.

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milker during this period the *marcaire* pays her owner about £2 10*s*. or £3 ; for grazing heifers not in milk, he is paid by the owner 10*s*.–17*s*. according to the quality of the pasture.

The chalets lie at an altitude of 1,000–1,200 metres, in the shelter of the summits. They consist of two buildings, a living-house, containing kitchen and sleeping-room, together with dairies and a loft for the servants, and a cow-house, generally with a hay-loft above. The life here during the summer is naturally a hard and strenuous one ; but it has been modified in recent years—to the detriment of its real purpose—by the influx of tourists, who tempt the *marcaire* to cater for them and neglect his cattle.

The produce of these mountain farms is cheese—Münster for the most part, and to a smaller extent Gruyère. Münster is a *maigre* cheese, red in colour when ripe, and having a characteristic wrinkled rind : 100 parts by weight of milk produce 12 or 13 of ripe cheese ; it is generally reckoned that each cow yields in the course of the summer 2 cwt. of cheese. As to the total production, a notice in the *Strassburger Post* (December 13, 1912) states that the annual yield of the Kaysersberg valley is over £100,000 worth, the Münstertal's over £50,000.

Gruyère is produced by only a limited number of *marcairies*, both in the Vosges and the Jura. These cheeses are harder and smaller than the true Swiss Gruyère. The best were made in the Alsatian Jura ; but the industry is declining in this region—a region well suited to it—and threatens to disappear altogether.

The ' parks ' of Lorraine have been mentioned above (p. 268). An increasing amount of cattle-breeding is carried on at present in Lorraine ; it is confined to the plain, but it appears on both sides of the frontier. On the French side it consists of cattle-fattening for the markets of Nancy, Paris, Metz, &c. ; on the German side the German market monopolizes the produce.

Sheep

Sheep-farming is in Alsace almost non-existent. There are only about 24,000 sheep in all Alsace : 6 and 2 respectively per agricultural square kilometre in Lower and Upper Alsace. In Lorraine the number is rather higher : 10 in German Lorraine, 17 in Meurthe-et-Moselle, 20 in Meuse, 8 in Vosges. Thus it will be seen that sheep-farming exists, though on a small scale, on the Lorraine plateau ; in the mountains it is negligible ; in

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the Alsatian plain there is hardly a trace of it. Even in Lorraine it is on the down-grade. The total number of sheep in the Reichsland has declined by 45 per cent. (from 191,000 to 63,000) since the annexation; the decline has of course been largely due to the spread of intensive agriculture and the consequent restriction of pasture suitable for sheep. It is only in *Kreis* Zabern, where the largest stretches of high and exposed plateau occur, that Alsace has any considerable number of sheep.

The system of sheep-farming is for shepherds (often immigrants from Württemberg) to take over the communal pastures and either graze their own sheep, paying rent to the *commune* for the pasture, or keep the sheep of the village, receiving wages from the various owners.

The native sheep are a poor strain. They cannot be fattened, and they produce only about 2 lb. of inferior wool, used locally for the making of home-spun fabrics. The Government has taken no steps to improve the breed or the condition of sheep-farming generally, and it seems unlikely that there is any future for this branch of farming in Alsace-Lorraine.

Goats

The number of these is not large, but, at any rate in the Reichsland, it has increased of late years, and goat-keeping seems to have a future before it. Goats are useful for two purposes: to pasture, along with cattle, in the Vosges, and to keep in the industrial districts, where their cheapness and adaptability make them a valuable source of milk-supply to the poorer population. The German Government has encouraged their use, and distributed a number of Swiss bucks in order to improve the strain.

French Lorraine is decidedly behind the Reichsland in this respect, though the number of goats kept in Alsace falls a long way behind that of southern German States whose conditions are similar.

Pigs

In French Lorraine the number of pigs about equals the number of sheep, and they are kept in the same way, namely by a communal herd who drives them out to pasture in the morning. The same herd often looks after pigs, sheep, and goats; if, however, the pigs are sufficiently numerous there is

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a separate swineherd. The swine kept on this system are lean, light-built animals with long heads and legs, and no superfluous flesh.

In the Reichsland this primitive system has been much modified. The German Government has devoted its most earnest attention to pig-breeding. It has succeeded, since the annexation, both in doubling the number of pigs and in greatly improving the stock—a triumph paralleled in no other branch of agriculture. The native pig has been crossed both with Yorkshire—80 boars being annually distributed by the Government since 1890—and with the best German blood ; the result is an animal which comes sooner to maturity and is easier to fatten, while retaining the hardy and prolific character of the original stock. Pigs now run 57 and 39 to the agricultural square kilometre in Lower and Upper Alsace, and 59 in German Lorraine.

Poultry

The Reichsland contains about 2½ million head of poultry, mostly fowls ; these are now in great demand locally, and efforts are being made to improve the breeds by co-operative methods. The great centres of poultry-farming are mostly situated in the Kochersberg region (Wanzenau, Bischheim, Hönheim, Gingsheim).

The geese of Alsace are famous. They abound in Lower Alsace, principally in the Kochersberg and Hagenau districts. The peasants keep them in large numbers, and fatten them for the general market ; for the manufacture of *pâté de foie gras*, which has always been principally made at Strasburg, a special kind of fattening is required, which is now almost exclusively in the hands of experts engaged by the manufacturers. This is a difficult and precarious undertaking, as the fattening birds are apt to be seized and exterminated by fowl-cholera. Consequently livers are now imported in large numbers from Russia, Slesvig, Hungary, and other countries, to make up the deficiency of the home supply.

Bees

Bee-keeping flourishes all over Alsace-Lorraine, and is highly remunerative. The number of hives (86,000 in the Reichsland) has not increased much since the annexation, but it is rising after reaching a minimum (57,000) in 1883 ; and considerable

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improvements have resulted from the increasing use of bar-frame hives and the importation of foreign strains from Carniola, Italy, Lüneburg, &c. Local bee-keepers' associations have done much to spread improved methods.

Silkworms

Many attempts at silkworm-breeding have been made, and in 1872 the production of cocoons in the Reichsland was 10,000 lb., of which 70 per cent. came from canton Schirmeck. But it appears to be now generally admitted that silkworms are a failure in Alsace-Lorraine.

Fish-Breeding

The numerous and extensive lakes and ponds of Alsace-Lorraine have been summarily described above, in the chapter on 'River Systems' (Chap. IV, pp. 88–96). It was there pointed out that three main types were distinguishable : the mountain lakes and tarns of the Vosges, the large shallow lakes of the Lorraine plateau, and the small pools of the Sundgau. Of these the second and third class alone concern us here.

The lakes of Lorraine vary from 2½ or 3 square miles in extent downwards ; they occur in the Keuper plain north of the Seille and in the Woëvre. Those on the Keuper (German Lorraine) are due in the first instance to subsidences caused by the washing-out of underground gypsum or salt-beds ; but, having worn through their natural barriers, they are now artificially kept in place by dams, many of which are very old. German Lorraine alone contains 200 of these lakes, aggregating some 16 square miles ; *Kreis* Saarburg contains 7½ square miles and *Kreis* Château-Salins over 5 square miles.

A few of the Lorraine lakes (Gondrexange, 1,820 acres ; Mittersheim, 628 acres ; Rixingen, 378 acres ; and others adjoining them) are used mainly as reservoirs for the Marne–Rhine canal and the Saar canal. These are accordingly never drained, though they are fished. But all the other lakes are periodically drained. The frequency of this operation depends on the preference of the individual fish-breeder ; but it is customary in Lorraine to drain the lakes every three years and keep them dry for a year. The dam is closed in October, so that the lake is filled by the autumn and winter rains : in the late autumn

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it is stocked, at the rate of 400–500 young carp to the hectare (160–200 to the acre). The fish run at this period 4 or 5 to the pound. They are left to grow for 2 years, and then, again in October, the lake is drained and the carp, now averaging 1½–2 lb., caught. Large lakes take a long time to drain, as the country is very flat and would be swamped if much water was released together; thus in some cases the operation of draining, begun in October, is not complete till the following April. The lake is now left dry till the following October, during which time it is ploughed and sown either with summer grains, especially oats, or root crops, vegetables, &c. This gives a good return to the owner, whether the planting is undertaken by himself or by a tenant; and is also considered good for the fish. After the harvest the dam is closed once more, and the process recommences.

Carp-breeding in German Lorraine is subject to various disadvantages. There is a respectable demand for the fish in the Rhineland and even as far afield as Berlin; but the necessity of selling off the whole two years' produce simultaneously whenever the lake is drained makes it difficult for the breeder to obtain a favourable market. This could be avoided only by a system of storage, not at present in existence.

In recent years trout (common and rainbow) have been introduced; about 30 lakes in German Lorraine were devoted to these in 1913.

The Sundgau lakes are about 300 in number, *Kreis* Altkirch alone containing some 200. They are, however, quite small: the largest is only 18 acres in extent, and the average area is 2½ acres. They generally occur, as already noted, in series; this facilitates draining. The lowest lake of a series is drained first, to be filled again by the water from the second when it in turn is drained; and so on. For, like those of Lorraine, the Sundgau lakes are artificially dammed and are drained at intervals.

The Sundgau lakes are drained for cultivation much less often than those of Lorraine. Instead of a normal three-year cycle, a cycle of 5 to 7 years is normal in this district, and one of 10 or even 15 years not infrequent. It is said that the shorter cycle is more in favour among owners stocking their own lakes, the longer among tenants. But this applies only to drainage for purposes of cultivation; for it is customary in the Sundgau

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to empty the lakes every autumn in order to extract the fish and transfer them to small spring-fed fishponds, 250 to 1,000 square yards in extent or smaller. These very seldom freeze, and are consequently more suitable for keeping the fish in winter. They also serve as temporary storage-tanks in which fish may be kept before being sold, while the breeder watches the market; this gives the Sundgau fish-merchants a great advantage over those of Lorraine. Prices are usually highest in spring, when Lorraine carp do not come on the market; the Sundgau breeder accordingly disposes of his stock in the spring when possible. The carp are usually sold when 3 years old, and weigh 1–1½ lb., in exceptional cases 2 or even 3 lb.

The result of these conditions is that the Sundgau breeder gets prices 40 per cent. higher than his neighbour in Lorraine, and rents and prices for fishponds are much higher in the Sundgau.

Apart from these lakes, various other fisheries may be mentioned. The French breeding establishment at Hüningen was abolished in 1905; but breeding-stations are maintained by local societies at Strasburg and Metz; there is a large station (trout) at St. Quirin, near Saarburg, and another (salmon trout, carp, pike) at Mutterhausen in the northern Vosges, which exports eggs and young fish to all parts of France.

The German Government still stocks the Rhine with salmon, though the number of salmon seems to be declining. Shad and sturgeon come up from the sea regularly, and lake trout, char, and other lake fishes come down from the Swiss lakes: but on the whole river-fishing in Alsace-Lorraine is poor, owing partly to the correction of the rivers and the draining of side-arms and backwaters, partly to the poisoning of the water by factory refuse. The German Government has of late years made efforts to improve the fishing by enforcing close seasons, hunting down otters, herons, kingfishers, &c., and stocking the rivers with young fish.

Woods and Forests

Distribution

Alsace-Lorraine is a country extremely rich in forests.[1] While France as a whole has less than 18 per cent. of its surface afforested, and Great Britain only 4 per cent., Alsace-

[1] See Atlas, Map 5.

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Lorraine has 34 per cent.; forests cover more than one-third of its total area.

The various political divisions differ little in the relative extent of their forest land. In Meurthe-et-Moselle forests occupy 26 per cent. of the whole area; in Meuse, 30; in Vosges, 36; in Lower Alsace, 33; in Upper Alsace, 34; and in German Lorraine, 26. But the physical divisions of the country differ markedly. Thus the Vosges chain, taken as a whole, has an area of some 1,275 square miles, of which 850, or exactly two-thirds, is forest (67 per cent.). In the Alsatian Jura forest occupies 36 per cent., or over one-third. Finally, in the Rhine plain and the Lorraine plateau forest accounts for one-fifth (20 per cent.). Thus it will be seen that the Vosges mountains are very heavily wooded, and the Jura fairly heavily; while the other two main divisions, though well supplied with timber, are at least open country as regards four-fifths of their area.

The following are the chief forest areas in Alsace-Lorraine:

1. The whole Vosges system. In the sandstone Low Vosges in the north the forest is uninterrupted save for clearings near villages mostly in the valley-bottoms. Three-quarters of the Low Vosges is forest. In the crystalline High Vosges open spaces are much more frequent both on the bottoms and lower slopes of the valleys and on the *hautes chaumes* of the summits. Here the forest is barely three-fifths of the whole area.

2. In the Alsatian plain three kinds of soil are afforested: first, the arid gravels of the Hart and Ochsenfeld (Hartwald, Nonnenbruch forest) in the south; secondly, the barren sands of the north (Hagenau forest and Bienwald); and thirdly, the alluvial, peaty soils along the Ill (Illwald) and Rhine (Rheinwald). Each of these has its own characteristic type of forest, the dense and jungly growth of the Rheinwald contrasting strongly both with the stunted and scattered oaks of the Hart and with the fine old timber of the Hagenau forest.

3. On the Lorraine plateau there are again three kinds of soil which are mainly given over to forest. First, the light and dry oolite and coral-rag soils of the Jurassic, especially the Côtes de Meuse (coral-rag) and the Haye (oolite). These form solid and massive belts of forest, extending north and south through the whole length of Lorraine. To these may be added the somewhat similar soils of the Rhaetian sandstone which

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forms a belt—narrower indeed, and much less continuous—of timbered country reaching the Moselle at Sierck; and the Bunter sandstone of the St. Avold forest in the north-east. Secondly, the diluvial gravel deposits (*terre blanche*) which appear on the higher parts of the plateau near Château-Salins, Lunéville, Charmes, &c.; these form a series of compact forests scattered over eastern Lorraine. Thirdly, there are certain places where the clayey and marly soils common in Lorraine are too cold and heavy for profitable cultivation, and here timber is allowed to grow. Such places occur on the Oxford clay of the Woëvre and notably round the lakes of the Saulnois, on the Keuper marls.

Climatically the whole of Alsace-Lorraine is suitable for timber, except the Vosges foothills in Upper Alsace and the immediately adjacent plain, for instance, round Colmar; here the rainfall is insufficient, and in consequence there is a good deal of land here which is physically adapted to forests but in fact has none; indeed there is no timber at all close under the lee of the High Vosges for this reason.

Species

The trees represented are almost equally conifers and deciduous species, 52 per cent. of the former and 48 per cent. of the latter. Of deciduous trees nearly two-thirds are beeches and nearly one-third oaks; of the conifers over half are silver firs, a third are Scotch pines, and the remainder spruces, except for a very few larch. The oak is often cut comparatively young, in the state of coppice-wood. With this exception, the deciduous timber mostly grows to an age of between 50 and 80 years, or even up to 100 years, while the quicker-growing conifers do not on average pass the age of about 50 years. But in both cases very large and old trees are met with: huge pines are found on the Vosges, up to 150 or 200 years old; there are some gigantic beeches; and certain famous oaks are 18 or 22 ft. in circumference 4 ft. from the ground.

The oak is in general found at the lowest levels; above these the beech takes its place; higher still, conifers predominate. In the High Vosges the series is complete. On the lower slopes—about 400 metres above the sea—the chief species are oaks and chestnuts; 200 metres higher, or thereabouts, beeches

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and hornbeams gradually begin to outnumber the oaks ; a little later again, these yield place to conifers, especially silver firs. Finally, at 1,000 metres, more or less, all trees cease together, leaving only the bare open grass of the *Hautes Chaumes*, dotted with occasional stunted beeches.

In the northern Low Vosges the pine-level is seldom reached. Here beeches predominate ; and most of the woods north of Zabern consist of beeches, as in the Lemberg district, or of oaks, as round Bitche. South of Zabern pines are often found even on the lower mountains ; thus the forest of Dabo is mostly pines, with a sprinkling of beeches.

In general the forests of the Low Vosges, though more extensive and continuous, are less magnificent and less dense than those of the High Vosges. The trees grow more thinly, and the forests more broken by open spaces of broom and heath. There is less large timber, and here and there, especially at the edges, there is a good deal of coppice.

Outside the mountain districts the forest trees are mostly deciduous. Thus the forests of the Lorraine oolites and sandstones are chiefly beech ; those of the gravel diluvium, both in Alsace and Lorraine, chiefly oak. Finally, the wet forests of the Alsatian plain—Rheinwald and Illwald—are very mixed, containing elm, ash, hazel, alder, maple, oak, and other trees.

Ownership

Four-fifths of all the forest in the Reichsland is public property, belonging either to the State, which owns nearly a third of the whole, or to the *communes*, which among them own nearly half. Seventy-two per cent. of the *communes* own forest, either (as in the great majority of cases) exclusively, or in part-ownership with other *communes* or the State. A very small fraction of the whole forest area belongs to companies, and about one-fifth of the whole is in the hands of private owners.

The tendency is for private woods to decrease in extent, though very slowly, owing to the clearing of land ; while State woods increase through afforestation. Thus between 1871 and 1911 the private woods decreased from 21 per cent. to 19·6 per cent. ; the State-owned woods rose from 30 to 31·3 per cent. of the whole area. Communal woods show no alteration.

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The State forests mostly owe their origin to the expropriation of large landowners at the time of the Revolution ; some were in the corporate possession of religious houses. Royal forests never occupied a large area in Alsace-Lorraine. The forest of Hagenau was in the twelfth century a possession of the Hohenstaufens ; it is now joint property of the State and the town of Hagenau, the latter having gradually extended rights of user in the forest and by degrees established a title to joint ownership. Communal woods owe their origin to a number of different processes : in some cases they are shares of an earlier common forest, divided among the *communes* ; in others they were seigneurial property confiscated at the Revolution ; in others they represent purchases ; in others again the *commune* has afforested its own pasture-land.

Of the private forests, which are mostly to be found in Lorraine, being rare in Lower and almost unknown in Upper Alsace, by far the greater portion date from the French Revolution, when they were purchased from the State, having previously been ecclesiastical or monastic property. Peasants' and other small holdings of forest-land are practically unknown in Alsace-Lorraine ; if such existed, they have been either cleared for arable or swallowed up at the time of the Revolution. Very few *communes* have ever divided up their common forest among their members.

Administration

The old French forestry service, a strongly centralized system dependent for all details on the policy of the central office at Paris, was replaced for the Reichsland in 1871 (December 30) by a new service on the Prussian model. Three independent centres were erected at Metz, Strasburg, and Colmar, with 63 minor local centres, a number increased in 1892 to 64. Of these local centres (*Oberförstereien*) the most important, i.e. those with a large area of State forest, were placed in charge of 16 *Revierförstern*, acting under the orders of the *Oberförster* and corresponding to *Hegemeister* in districts where communal forests predominate over those of the State. Of the rank and file of the foresters some 270 are imperial foresters, and about 400 are employed by the *communes*. The imperial foresters often undertake the care of communal forest in addition to their special work.

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The forests of French Lorraine are to a very great extent used as a training ground for the French National School of Forestry at Nancy.

The Germans claim that they found the forests of the Reichsland in a very bad condition and that they have greatly improved them since 1871 by improved methods of forestry. Certain French observers disagree with this view. Ardouin-Dumazet (*Voyage en France*, vol. 50, p. 30) reports a conversation with manufacturers in the Dabo district in which it was asserted that the Germans were stripping the country of timber, that no oak was left (1907) in the State forests, and that the beeches and conifers were being cut before reaching maturity in such a way as to impair from year to year the value of the forests.

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CHAPTER XIII

MINERAL RESOURCES

THE mineral resources of Alsace-Lorraine are very remarkable. In the north-west is the *minette* ironfield, extending from the Belgian frontier to a little way south of Nancy, the most important iron-ore deposit of Europe, with an area of 463 square miles and a total reserve of 5,800,000,000 metric tons of ore, equivalent to, say, 2,000,000,000 tons of pig-iron, all easily accessible and of great industrial value. On the north-east, partly lying within Lorraine and partly outside, is the Saar coalfield, which together with its annex, the Pont-à-Mousson field, has an area of 869 square miles, and probably contains between 33,000,000,000 and 53,000,000,000 metric tons of coal. In the centre, reaching from Nancy and Lunéville to Saaralben, is a great salt-field containing vast reserves of salt in the form of brine. Finally, in the extreme south, between Mulhouse and Colmar, is a deposit of potash salts—a mineral with respect to which, apart from this deposit, northern Germany possesses an unchallenged monopoly. This field covers an area of 78 square miles and contains over 1,000,000,000 tons of potash salts, or enough to supply the entire world's demand at its present figure for about 250 years.

These four deposits are of primary importance; there are others, less noteworthy. Among these may be mentioned: a small oil-field; mineral springs; various coal-deposits, more or less insignificant; stone, clay, and sand; and finally, the various ores of the High Vosges. The oil, the mineral springs, and outlying coal-deposits are treated in this chapter; the quarries, potteries, and glass-works are deferred to the next chapter, where they are treated as industries; and the same applies to the mines of the Vosges. The last-named have been important in the past, but they are now inconsiderable, and it appears hardly likely that they will again become important.

The *minette* field and the Saar coalfield have been dealt with

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at length in the *Manual of Belgium and the Adjoining Territories* (I. D. 1168, with Atlas). They are therefore treated only summarily in this chapter.

Iron

(The Minette Field)

The word *minette*, literally meaning 'kitten', has long been applied to the oolitic iron-ore of the Briey plateau, in allusion to the weakness of the metal which it produces. This weakness, or rather brittleness, is due to the high percentage (1·7 to 1·9 per cent.) of phosphorus contained in the ore. In consequence of this characteristic, *minette* was quite useless for metallurgical purposes before the discovery of the Thomas-Gilchrist process in 1878 and its first practical employment at Hayange in 1882. For an outline of the technical aspects of this process see *Manual of Belgium*, p. 395. Since that date the mining of *minette* ore has advanced by leaps and bounds, and reached 48,000,000 metric tons in 1913.

Before 1882 the Lorraine iron-works depended for their supply of raw material on veins of alluvial iron-ore associated with the *minette* but, unlike it, devoid of phosphorus. The pig produced from these ores was free from the objectionable brittleness of *minette* pig, and was in consequence known as *fer fort*. These were the deposits of which Germany aimed at annexing as much as possible in 1871; the *minette* was at that period valueless.

The following table shows the ore-production of the *minette* field in comparison with the rest of France and Germany, and, for the sake of comparison, this country and the United States. The figures are in millions of metric tons, and refer to 1913.

Minette field	Rest of France	1·9	21·7	all France
	in France	19·8		
	in Luxemburg	7·3	48·2	whole *minette* field
	in Germany	21·1	28·6	all Germany
	Rest of Germany	7·5		
	United Kingdom	16·0		
	United States	62·0		

Thus in 1913 the Lorraine *minette* accounted for three-quarters of the ore-production of Germany and nearly 90 per cent. of that of France, while the total output of the field

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was three times that of the whole United Kingdom. Of these three countries, it is to be observed, Germany and the United Kingdom are importers of ore and exporters of coal (Germany imported 14,000,000 tons of ore in 1913), while France exports iron-ore and imports coal. The danger that haunts the French iron-mining industry is the same danger that haunts the coal-mining industry of Germany—over-production. Germany on the other hand is so far from over-producing iron-ore that after losing Lorraine she will win from her own soil at most only one-sixth of what she was smelting in 1913, and will require to import 35,000,000 tons if her consumption remains constant.[1]

For further details we must refer to the *Manual of Belgium*, pp. 390–407, where the fullest available details of the whole field are given. It may be remarked that the details for the German section of the field are much less full than for the other sections; this is due to the fact that German authorities give very scanty descriptions of their own mineral resources, and that the German contributions to such international compilations as the Geological Congress's *Iron Ore Resources of the World* are so brief as to be a mere outline of the subject instead of a full report.

Coal

Alsace-Lorraine contains three classes of coal-deposits.

First, the Saar field, or that portion of it which falls within Lorraine. It will be remembered that Saarbrücken was a part of Lorraine, and that in consequence at least half the Saar field was a French possession even before the expansion which took place at the end of the eighteenth century; its mines were developed entirely by French capital and initiative; it was confirmed to France by the Treaty of Paris in 1814; and only in 1815 did the Prussians succeed in depriving France of the Saar valley and pushing the frontier beyond the presumed limit of the coal-deposits. Even so, subsequent investigations revealed a valuable prolongation of the Saar field beneath the soil of Lorraine, and this—the Lorraine portion of the Saar

[1] Reference may here be made to the well-known 'Confidential Memorandum of German Metallurgists', December 18, 1917, in which the necessity of annexing the whole remainder of the *minette* field was elaborately demonstrated 'if Germany is to recover her military power, her economic strength, and the prosperity of her working classes, and to be supplied with munitions for the next war'.

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field—is by far the most important source of coal within Alsace-Lorraine.

Secondly, the annexation of north-eastern Lorraine to Germany and the later development of the *minette* ironfield stimulated the search for coal in France, and a further prolongation of the Saar field was discovered on both sides of the Moselle at Pont-à-Mousson.

Thirdly, there are a number of scattered deposits in the south-west of Lorraine and in the Vosges. The Vosges deposits alone are of any value, and even these are for the most part insignificant.

We shall now describe these three classes of deposit in order.

The Saar Coalfield

A description of the Saar field as a whole has already been given in the *Manual of Belgium and the Adjoining Territories* (I. D. 1168), pp. 373–7 ; see also the accompanying *Atlas* of that volume (I. D. 1168A), map 7, for a detailed map showing the distribution of the various collieries. Without repeating all that was said there, we may resume a few of the chief facts regarding the Lorraine deposits.

The coal-measures nowhere in Lorraine reach the surface. At Kleinrosseln (Petit Rosselle) they begin only about 65 ft. down ; at Spittel (l'Hôpital) nearly 1,000 ft. down. They consist of sandstones, shales, and conglomerates, and include from 15 to 18 seams of coal having an aggregate thickness of 56 to 61 ft. The chief mines are at these two places ; but an area of 118,200 acres has been conceded for mining purposes, and it is probable that the whole of this area contains valuable deposits. In many places, however, the deposits lie a long way down ; but it is universally admitted that the reserves down to a depth of 6,500 ft. are very large.

The mines at present existing are as follows : at Petit Rosselle, five pits (Joseph, Charles, Gargan, Vuillemin, Wendel) ; at Styring-Wendel, two pits (Stéphanie, Simon) ; at l'Hôpital, six pits belonging to the Société Sarre-et-Moselle (Max, and pits II–VI) ; at St. Avold, one pit belonging to the Société Houillère Internationale ; at Kreuzwald, two pits (Julius, Marie) belonging to the Mines de la Houve. There are nine or ten other concessions which are not yet exploited ; some of these are held by steel-working companies established

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in the Moselle valley, such as the Rombas Steel-Works. Lorraine thus contains only 16 pits as opposed to 78 pits in the Prussian Saar field, and produces only 2,800,000 tons per annum as opposed to 12,000,000; that is, it has about one-fifth the number of pits and produces less than a quarter the quantity of coal; but on the other hand its output [1] is rising more rapidly than that of the Prussian mines, and the quality [2] of the coal obtained appears to be on the whole better.

For these reasons it is stated by various authorities that the Lorraine mines are likely to prove in the future the most prosperous element in the Saar field as a whole; and it appears that the centre of gravity in the whole field is shifting south-westward.

This displacement of the centre of gravity will become even more pronounced should it be discovered that the area between the German Nied and the frontier contains payable deposits. The coal-seams, which are close to the surface in the Saar valley, dip downward toward the south-west, and the official German view is that beyond a line running through Boulay, Hémilly, and Faulquemont, they lie too deep to be worth exploiting. This view, however, does not seem to have been proved by actual borings; and the statements on the subject leave the impression that the German authorities have not been very anxious in the past to find coal under the soil of French-speaking Lorraine. Accordingly no borings appear to have been made, and no concessions have been granted in this area. A thorough exploration of this district is therefore urgently needed.

[1] The output of the Lorraine mines (discovered in 1856) was 0·3 million tons in 1872; 0·6 in 1882; 0·8 in 1892; 1·3 in 1902; 2·5 in 1909; 2·8 in 1913.

[2] The Saar coal in general is not of a very high quality. For the most part it is bituminous or long-flame, and suitable for industrial and domestic consumption; but the percentage of ash is everywhere rather high, and the metallurgical coke (which works out at 54 per cent. of raw coal, or 12·5 per cent. less than in the case of Westphalian coal) is considered a somewhat low-grade article. Coking coal is mostly won on the right bank of the Saar; 1,640,000 tons of coke were made on the Prussian State coalfield in 1913.

As regards the total output of the Saar field, 15,600,000 tons were extracted in 1913, a figure which remains almost stationary from year to year and could certainly be surpassed by energetic mining. Of the 13,000,000 tons produced by the Prussian State mines, about 4,000,000 are employed by metallurgy, 3,200,000 by domestic consumers, 1,500,000 by gasworks, and 1,400,000 by railways.

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The Pont-à-Mousson Coalfield

We said above that the coal-bearing strata continued to dip gently below the surface on a line running south-west from the Saar valley, and are supposed to lie out of reach in the basin of the French Nied. Farther on, however, a transverse fault brings them once more to within a short distance of the surface. This fault runs through the villages of Solgne and Achâtel, close to the Metz–Château-Salins strategic railway; and from this line the accessible coal-measures run south-westward under the Moselle. This is the Pont-à-Mousson coalfield, described in the *Manual of Belgium*, pp. 370–1. The workable field within the French frontier consists of 37,000 acres, none of which has been conceded; this area is estimated to contain 330,000,000 metric tons of coal. The difficulties of working are, however, considerable; the overlying strata are largely water-bearing; and the seams are distinctly less rich than those of the Saar. In general it seems to be admitted that only despair of obtaining coal from the Saar field could make it worth while exploiting the Pont-à-Mousson field in the present conditions.

The field projects into German Lorraine round the villages of Vigny, St. Jure, Solgne, and Achâtel. Here a concession has been taken up by the Rombas Steel-Works; and this would appear to be the most promising portion of the field for exploitation, though no mining has been actually carried out.

Isolated Occurrences of Coal

Coal has been discovered and worked on a small scale in the Faucilles; shafts have been sunk at Bulgnéville and Norroy. The output was, however, insignificant, and work was soon stopped. Farther north, on the edge of the Xaintois, a little colliery still exists at the village of Gemmelaincourt, in the Vraine valley. Some writers suggest the possibility of extensive coal-measures in this district, but there appears to be little, if any, evidence for such a view.

Another small colliery, but of greater importance than the foregoing, is that of Ronchamp near Champagney on the southern edge of the Vosges (Belfort district). Here the seams worked (carboniferous) are of a purely local and restricted character, though the output is large enough to play an

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important part in the industry of Belfort. There are two concessions about a mile apart, at Ronchamp and Éboulet respectively, belonging to the same company; the annual output is about 250,000 tons, of which one-third is won at Ronchamp, the remainder at Éboulet. The output will be increased beyond this figure by new shafts. The steep inclination of the seams renders mining difficult; the two existing shafts are respectively 1,000 and 2,900 ft. deep, and the new shafts will probably be deeper still. The number of hands employed was in 1900 about 1,400 (probably greater by now, since the extension of the workings). The Haute-Saône Canal will, when completed, prove of great value to this colliery.

The Alsatian slope of the Vosges contains a number of small coal-deposits like that of Ronchamp, but on a smaller scale. Reviewing these from south to north, the first is at Burbach, between Massevaux and Thann; here two experimental shafts ('Moltke' and 'Bismarck') have been sunk, but the results obtained have been very small. Farther north a deposit at Le Bonhomme (Diedolshausen) has been tested, and a company was formed in 1899 to work it; it does not appear to have proved payable so far. The coal is of the nature of anthracite. A similar outcrop occurs at Hury, a little east of Markirch; this was worked in the eighteenth century. At St. Pilt (St. Hippolyte) and Rodern, in the foothills between Rappoltsweiler and Schlettstadt, there are similar old coal-mines.

The Weilertal contains rather larger and more continuous deposits. Till about 1850 at Lalaye (Laach) a series of five small seams was worked, but mining was abandoned at that time. Another mine in the same neighbourhood is at Erlenbach.

These Alsatian mines produced on average 1,500 tons of coal per annum between 1810 and 1866; after this the output declined to nothing and has never revived.

The lignite deposits of Alsace-Lorraine are now of no importance.

Petroleum

Alsace contains one small oil-field of commercial importance, beside a number of sites which reveal traces of oil and allied substances. Thus traces of petroleum have been revealed by borings at Niedersept, Ueberstrass, Bisel, Köstlach, Rüderbach, and Bettendorf, in Oligocene clays. All these sites are

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in the immediate neighbourhood of Ferrette, in the southern Sundgau, in or between the valleys of the Ill and Larg. The oil-deposits of this region have been long known ; the name of the Oelbach, a small tributary of the Ill debouching half-way between Bettendorf and Altkirch, is due to the fact that its water sometimes shows a film of oil. Attempts were made to work this deposit in the late eighteenth and early nineteenth century, but it never proved payable.

The Vosges foothills also show traces of oil and of gas ; the latter is reported at the copper-mines of Mollau and St. Amarin, the former in the coal-measures of Rodern and in an abandoned mine near Markirch. Mineral pitch is found in the oolite of Sentheim ; bitumen in a vein of barytes at St. Pilt and in gneiss at Eschéry (Eckerich) near Markirch ; and asphalt at Lalaye. Farther north traces of petroleum have been detected at Molsheim and at a number of places in the 'gulf' of Zabern, and bitumen has frequently been found in this region at the foot of the Vosges.

These deposits, however, are insignificant. The only deposit of commercial importance is that which lies in the Oligocene belt of Lower Alsace in the neighbourhood of Wörth and Sulz. Here the formation concerned is a series of thin strata of petroliferous sand or shale, enclosed between thick beds of impermeable clays and marls. Earth-disturbances have caused the whole plain to be slightly squeezed between the Vosges and Black Forest massifs, and this has crushed the strata into a series of alternate anticlinal and synclinal folds which concentrate the oil into productive belts separated by sterile areas. The oil-bearing strata appear to be lenticular in shape and seldom of any considerable size ; they lie deep enough to be tolerably secure from damage either by water or by evaporation.

The petroliferous strata belong to the lower Oligocene. Upon this lies a series of middle Oligocene beds containing limestones and sandstones which in certain places are saturated with asphalt of excellent quality. This is worked at Lobsann and Kleeburg.

The oil industry of this region is of great antiquity. The spring to which Pechelbronn owes its name was discovered in 1498 ; the peasants skimmed the oil off the surface of the water and used it as a lubricant and for burning. In 1735 an outcrop of oil-sand was discovered close by, and operations

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on a small scale were at once begun. Between 1785 and 1888 regular mining was carried on; the bituminous sand was won by means of shafts and galleries and the oil extracted. This process was wasteful, and came to an end when the increasing depth of the workings caused them to be flooded with fluid petroleum. In 1881 boring was introduced, and the Canadian system of drilling was inaugurated in 1889 with satisfactory results. The deposits are now worked by pumping from drilled wells, refineries being erected in the immediate neighbourhood; the refineries are situated at Biblisheim, Oberstritten, Ohlungen, and Uhlweiler. The total number of wells in operation is about 250, and the yearly output is generally about 30,000 tons or 40 per cent. of the total German output.

There are also oil-springs at Sturzelbronn and Walschbronn, east and north-north-east of Bitche; these rise in the Vosgian (lower Triassic) red sandstone.

Salt and Allied Deposits

Substances existing in ordinary sea-water in a state of solution are often found deposited in solid form where lagoons or arms of the sea have been evaporated. Such evaporations have taken place in recent times in such countries as eastern Persia; but at a more distant period—the late Triassic and early Jurassic—northern Europe was a conspicuous example of the same process. To this fact is due the enormous salt-deposits of Germany, which, though the exact conditions of their formation are a matter of controversy, are regarded as having been formed by the evaporation of sea-water. These deposits cover the greater part of the north German plains, and reappear in Lorraine and Alsace.

Evaporation-deposits contain three chief substances—gypsum, common salt, and potash. Gypsum, as the least soluble, is first deposited, then salt, and lastly potash. The rarity of potash deposits is due to the fact that this substance is never deposited at all unless the evaporation continues undisturbed to the very end; in most cases the conditions allow the water to escape after the evaporation has caused the crystallization of gypsum alone, or gypsum and salt, but before the potash has been deposited. To this is due the fact that no extensive potash-deposits have anywhere been found, in spite of careful search, except in central Germany and in Alsace.

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The deposits of Alsace-Lorraine belong to two different and widely separated geological periods. The first was a long, though not continuous, period, beginning in the middle of the Triassic age and lasting into the Jurassic ; the result is that evaporation-deposits occur intermittently in the Muschelkalk, Keuper, and Lias. These are naturally found for the most part in Lorraine, where those formations are most widely distributed ; but fragments of similar deposits are to be seen in the Alsatian foothills. The second period was the Oligocene division of the Tertiary, when the Rhine plain was an arm of the sea which subsequently dried up. This desiccation was the origin of the Alsatian potash-bed.

Gypsum

The middle Muschelkalk contains here and there lenticular domes of gypsum. These are worked in quarries at various places in northern Lorraine, such as Rohrbach and the district between Sierck and Montenach. The Saar salt-field, mentioned below, belongs to this series of deposits.

The middle Keuper consists locally of five divisions, of which the lowest contains not only the great salt-deposits of the Saulnois (see below), but also considerable quantities of gypsum, both in the form of pure masses and in that of impregnation-deposits. It is found both in Lorraine, where it is largely quarried at Rémilly and elsewhere, and also in Alsace, where there are quarries at Balbronn, Bergheim, and Reichenweier (near Rappoltsweiler), and other places.

The red marl, the fourth division of the middle Keuper, also contains large quantities of gypsum. It occurs in large masses, and takes the form both of coarse and of fine-grained stone (alabaster). It is worked especially in the Canner valley, from Königsmachern to St. Hubert ; also at Vic and Amelecourt ; also at several places in Alsace, such as Willgottheim, Küttolsheim, Waltenheim, &c.

The Lias also contains a certain quantity of gypsum.

Rock-Salt

The rock-salt deposits are closely connected, in distribution as well as in origin, with those of gypsum. The salt-field of Saaralben belongs to the middle Muschelkalk ; it is exploited in several brine-pits at Salzbronn, Saaralben, and Haras.

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The great salt-field of central Lorraine centring round Château-Salins, Vic, and Dieuze consists of a large group of very thick but, as a rule, not very extensive deposits in the neighbourhood of Dieuze, Moyenvic, Vic, Chambrey, Château-Salins, and elsewhere. The output consists solely of brine, which is evaporated after extraction; the last rock-salt mine was closed in 1866 owing to flooding.

The Nancy field consists of deposits in the Liassic marls. Here again the deposits are very large and are mostly contained in brine; but there are also rock-salt mines.

Rock-salt has also been discovered in Upper Alsace, in conjunction with the potash-deposits. No estimate of the reserves appears to have been made; nor can it be deduced from the output, since that is controlled in the case of the German brine-pits by the conditions of the trade and not by the producing power of the deposits. The following figures could, it is said, be increased to any required total.

The brine-pits of German Lorraine produce yearly about 60,000–70,000 tons of common salt and 8,000 tons of Glauber salts. About one-sixth of the output is reserved for industrial purposes; the rest is put on the market for domestic consumption. The works of the Nancy field on the other hand, including eighteen brine-pits and the three rock-salt mines of St. Nicolas, Varangéville, and Einville, produce annually 160,000 tons of refined salt and 100,000 tons of rock-salt, besides the vast quantities that are made into soda, of which 300,000 tons are made annually.

Potash

In 1904, while a boring was being made for oil at Wittelsheim, half-way between Mulhouse and Gebweiler, a deposit of rock-salt was encountered at 1,175 ft., followed by a bed of potash at 2,057 ft. and another at 2,129 ft. Systematic investigations were set on foot, and it was discovered that the upper bed, averging 3·8 ft. in thickness, extended over an area of 33 square miles, while the lower and more important deposit, 11·53 ft. in mean thickness, was no less than 67 square miles in area. Taking the two beds together, it was shown by a series of 120 borings that the deposits extended over 78 square miles, not to mention the fact that they reappear on the right bank of the Rhine in the Grand Duchy of Baden.

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The deposits consist chiefly of sylvinite, which is a mixture of sylvine (K Cl) and common salt (Na Cl). The beds appear to contain 84·5 per cent. of sylvinite, which works out at 1,142,000,000 tons of potash minerals containing 300,000,000 tons of pure potash. The gross value of the deposit at current pre-war prices was estimated at 50 milliard marks, or roughly £2,500,000,000.

This sum, however, could in the nature of the case be realized only with extreme slowness. The supply of potash has always—apart from very small quantities produced by kelp-burning and similar processes—been a monopoly of the Stassfurt district, and the monopoly was jealously guarded. The trade was in the hands of the German *Kalisyndikat*; prices and output were carefully restricted with a view to the demand, export prices being fixed higher than those for the home market. In short, Germany enjoyed in her potash deposits a monopoly which not only brought in a handsome profit, but could be conveniently used as an economic weapon in a large variety of ways.

Had not Alsace been German territory, the discovery of 1904 would at once have destroyed this national monopoly; for the Alsatian beds alone would supply the whole world-market for some centuries. As it was, the newly discovered deposits came at once under the control of the *Kalisyndikat*, which allowed them indeed to be exploited, but confined their yield to 4 per cent. of the total German output. Taking the latter as roughly equivalent to £10,000,000, this would mean an Alsatian output of only £400,000 per annum. In 1913 the yield had already reached £200,000, and was therefore rapidly approaching its destined maximum. Accordingly the present installations are quite incapable of producing such a yield as to rival that of the Stassfurt field; and before the Alsatian deposits can be employed as an economic weapon against Germany, enormous developments must take place.

It is also to be observed that such developments will inevitably result in over-production. The present prices are kept up only by a rigorous restriction; if the deposits of Stassfurt and Alsace were freely worked in mutual competition, the prices would immediately fall to figures which, if unchecked, would threaten the entire industry.

This was already pointed out by German authorities during

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the war, in reply to the suggestion that a development of the potash trade might go far to paying Germany's war debt. Further, a report forwarded by the *Kalisyndikat* to the Legislature in 1918 remarked that the trade was equipped for a certain output only, and could not for some years after the conclusion of peace meet even the ordinary demand. This points to a period of high prices for some time to come; but such a condition cannot be permanent.

Mineral Springs

Alsace-Lorraine is rich in mineral springs. Four groups may be distinguished: the Alsatian group, the south-western Vosges group, the Faucilles group, and the Sierck group.

The Alsatian Group.—These are disposed along the foothills of the Vosges; their frequency in this region is due to the system of faults which separate the mountains from the plain. Altogether these springs are very numerous; we shall describe only the most important.

Beginning in the south, the first is at Wattweiler, north of Cernay. Here the mineral springs have given rise to a somewhat important little watering-place, frequented by persons suffering from anaemia. At Sulzmatt, between Gebweiler and Rufach, is a spring yielding cold water impregnated with carbon dioxide and containing sodium bicarbonate; this is bottled and used as a table-water. At Sulzbach in the Münstertal are four springs containing carbon dioxide, sodium bicarbonate, and iron salts; the water is used as a tonic and purgative, and is bottled for table use and as a cure for anaemia; the former establishment is no longer open. At Rappoltsweiler is a calcium-sulphate spring, recommended for gravel and disorders of the urinary system; it is exploited in a local sanatorium. There is also a carbon-dioxide spring, bottled for table-water. At Châtenois (Kestenholz) near Schlettstadt are two springs (54° and 65° F. respectively) containing sodium chloride (common salt) and iron; the water is drunk as a remedy for gravel, dropsy, scrofula, anaemia, and other complaints; the former bathing establishment no longer exists. Bad Bühl, just outside Barr, possesses mineral springs which have made it a popular bathing resort ever since the eighteenth century. There is a mineral spring at Rosheim. Sulzbad (Soultz-les-Bains), between Molsheim and Wasselonne, is a

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small bathing establishment with saline springs. Niederbronn is the most important of the Alsatian watering-places. It is a town of some 3,000 inhabitants, almost entirely subsisting on the profits arising from the mineral waters. These are saline, and are used both internally and externally for dropsy, skin complaints, affections of the liver, rheumatism, gout, gravel, and other diseases. There is a large *Kurhaus* and several hotels. The spring was used in the Roman period; its modern exploitation dates from the sixteenth century.

The South-Western Vosges Group.—This group includes four sites: Bussang, close to the source of the Moselle; Plombières, south of Épinal; Bains-les-Bains and Luxeuil, in the plain at the foot of the hills.

Bussang has a group of wells whose water (cold) contains iron salts, sodium bicarbonate, and carbon dioxide. It is much esteemed as a table-water, and over a million bottles are sold annually; in addition there is a flourishing health resort including hotels and bathing establishment. The springs occur in a group about a mile from Bussang toward the top of the pass.

Plombières is a fashionable watering-place, a favourite resort of Napoleon III, who rebuilt it to its present scale. It had already been a resort for centuries; Montaigne, Richelieu, Voltaire, and numerous other people of note had been counted among its visitors. There are now seven bathing establishments, three drinking establishments, and one inhaling; the water issues from twenty-seven springs whose temperature varies from 54° to 165° F., the hotter springs containing a higher percentage of minerals. These consist primarily of sodium sulphate and silica. There is one chalybeate spring. The waters are used in treatment for rheumatism, paralysis, skin diseases, and others. The springs were used in the Roman period, and baths of Roman construction have been refitted and brought into use again.

Bains-les-Bains (or Bains-en-Vôge) also was a Roman resort. There are sixteen springs (88° to 124° F.) containing sodium sulphate with traces of iron and arsenic. There are two bathing and drinking establishments; the water is especially used against rheumatism and nervous complaints. The modern utilization of the water dates from the late seventeenth and early eighteenth centuries.

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Luxeuil has a continuous history dating back to the Roman era. The water contains radio-active elements, sodium chloride, iron, and manganese, and is used for female complaints, anaemia, rheumatism, digestive troubles, &c.

The Faucilles Group.—This group consists of Vittel, Contrexéville, Martigny-les-Bains, and Bourbonne-les-Bains, with an outlier at Doulaincourt near Neufchâteau.

Vittel has four springs (cold) containing magnesia, calcium sulphate, and carbonate of iron. They are used, taken internally, against gravel, gout, &c. The spa dates from 1836, and consists of a large establishment with pump-room, baths, &c., a casino and theatre, and hotels.

Contrexéville, about 3 miles south-west of Vittel, is a village which has recently become a considerable watering-place with good buildings, casino, &c. There are five springs, discovered in 1759; the water, which is cold, contains calcium sulphate and is very useful in cases of gravel and affections of the urinary system.

Martigny-les-Bains lies a few miles farther to the south-west. There are two springs (51° F.) containing calcium sulphate and lithia; they are mostly used internally, but also, to a less extent, in baths and douches; gravel, gout, and colic are the complaints mostly treated.

Bourbonne-les-Bains lies about 10 miles farther south. The water contains sodium chloride and is used in cases of dropsy, rheumatism, and skin troubles.

The Sierck Group.—The whole neighbourhood of Sierck is especially rich in mineral springs; most of them, however, are unimportant and have never developed into watering-places. The most noteworthy springs are those of Niederkontz, Rettel, and Königsmachern; but of these only Niederkontz possesses a medicinal bathing establishment.

It will be observed that we do not include in this section the numerous Lorraine brine-pits, which may in a sense be regarded as mineral springs; they are treated above, under the heading of 'Salt'.

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CHAPTER XIV

INDUSTRY

THE two main industries of Alsace-Lorraine are metallurgy and textiles. The former is located in northern Lorraine, from Longwy to Nancy; the latter in the valleys of the High Vosges. The iron and steel-works of northern Lorraine have spread, under the attraction of the Saar coalfield, to the valley between Saarbrücken and Saarlouis; and forges and iron-works reappear on the western margin of Lorraine and in the upper basin of the Saône, and even here and there in the Vosges valleys; while the textile industry, formerly confined to Alsace, extended after the annexation of 1871 to Lorraine and now fills the western Vosges no less completely than the eastern.

No other industry approaches these in importance. For many centuries Lorraine has been famous for its glass-works, and these still exist, concentrated in a belt which follows the junction of the Vosges with the plateau; engineering works, primarily an offshoot of the textile industry, have attained a certain importance in Alsace; foodstuff industries, notably preserved meats and vegetables, flourish at Strasburg and Metz; there are chemical works in some of the chief Alsatian textile centres and on the salt-field of Lorraine. Lace-making and embroidery are home industries all over the Lorraine plateau, especially in the south and east. Finally, there are certain purely local industries—optical and mathematical instruments at one town, musical instruments at another, plush at another—which call for mention.

HISTORICAL SKETCH

The roots of industrial history in Alsace-Lorraine go back to a remote past. Before the eighteenth century laid the foundations of modern manufacture, there were several well-established industries up and down the country. Iron was mined and worked both in north-western and in south-western Lorraine; the furnaces and forges of the Briey plateau and the

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Barrois, though of course on a small scale, were already flourishing institutions. The forges of the Vôge were no less important. Other mines, of silver, copper, lead, and so forth, existed in the High Vosges. The conjunction of sandstone and unlimited timber in parts of Lorraine had given rise to an already widespread glass-industry, which was one of the main facts in the economic life of Lorraine. Finally, the power and purity of the Vosges rivers had been turned to account by a number of paper-mills.

The industrial revolution began to affect Alsace-Lorraine in the middle of the eighteenth century. The first establishment for printing cotton fabrics at Mulhouse was founded in 1746. It was followed by a considerable movement of cotton-spinning and weaving, beginning at Mulhouse itself, at Thann, and in the valleys of the south-eastern Vosges. Hand-weaving was at first general; and in 1806 a prefect of the Haut-Rhin reported that there were 15,000 hand-weavers in the valleys of Upper Alsace. But power-looms were gradually coming into use. At first water-power was widely employed; all through the early and middle nineteenth century cotton-mills for spinning and weaving were being built in the Alsatian valleys, working higher and higher up the streams in order to make full use of the water-power, and increasing their resources in this respect by damming the Vosges tarns (especially in the thirties; see Chapter IV).

But steam-power had already made considerable progress. It was introduced at Mulhouse in 1812, and from the first competed successfully with water-power. At Mulhouse it was indispensable; but even in the Vosges valleys it soon began to displace its rival. The only obstacle to its complete success was the difficulty of obtaining coal; but the improvement of communications between 1830 and 1860 did much to overcome this difficulty. Railway construction was early undertaken in Alsace. The Mulhouse–Thann line was opened in 1839; that from Bâle to Strasburg, through Mulhouse, in 1841. Both these lines were the direct creation of the cotton interests at Mulhouse. At the same time the canal system was being remodelled. In 1834 the Rhone–Rhine canal acquired a regular service, and a new port was built on it at Mulhouse in 1837. Thus by about 1850 the manufacturing district of Alsace was in a position not very far removed from its

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present state. The valleys were already studded with cotton-mills; good communications by rail and water had been established; and the industrial towns, already large, were growing rapidly. The development during the third quarter of the century proceeded almost exclusively on lines already laid down. New mills and new railways were built, and the population continued to increase with a growing momentum; and the accessory industries—engineering, chemical works, and so forth—became more conspicuous.

The only really new feature in the third quarter of the nineteenth century, so far as Alsatian industry is concerned, was the rise of industrial establishments on the western slope of the Vosges. These were especially cotton weaving-mills, depending on the Alsatian spinning-mills for their thread and sending the bulk of their output to Mulhouse and Colmar to be dyed and printed. There was thus the closest connexion between the cotton industry of the eastern slope and that of the western. But the mills of the western valleys—the Meurthe, the Moselle, the Vologne—were still insignificant in 1870, compared to their great development since that date, though already in 1870 they contained some 270,000 spindles and 1,600 power-looms.

Thus in 1870 the industries of Upper Alsace were at the very zenith of their prosperity. Mulhouse had multiplied her population by 8 in 70 years, and the other cotton towns had risen proportionately. Every branch of the cotton industry flourished throughout the valleys of Upper Alsace, in addition to large numbers of woollen mills; great chemical works at Mulhouse, Thann, Colmar, &c., provided dyes; and engineering works at Mulhouse, Grafenstaden, and elsewhere supplied machinery and means of transport. In short, a map showing the industries of Alsace in 1914 represents not inadequately their condition in 1870. On the other hand the great industrial belt which now stretches from Belfort to St. Dié was only coming into existence.

Turning now to the Lorraine plateau, we find a development no less striking, but one which began half a century later than that of Alsace. The vast iron-ore deposits of the *minette* field were not known in their full extent, but their outcropping edges to east and north were known and worked on a limited scale from the Middle Ages. The workings were confined to the comparatively small deposits of ore which were sufficiently

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free from phosphorus to yield a pig of good quality. But these workings were already important early in the eighteenth century, when the Wendel family became the leading force in Lorraine metallurgy. During the eighteenth century Lorraine, like Alsace, though to a less degree, felt that rise of population which heralded and in great part caused the industrial revolution. The demand for industrial products increased, and at the same time the forests of Lorraine, on which the iron-works had hitherto relied for fuel, began to show signs of exhaustion. New sources of fuel for every purpose became necessary. The problem was solved by the addition to France in 1793 of the Saar basin. Saar coal, which had hitherto been mined on a small scale only, was won in rapidly increasing quantities under the vigorous policy of France, and the output increased threefold between 1793 and 1815. The coke-fired blast-furnace did not yet exist, in spite of repeated experiments in that direction throughout these years ; the difficulties were not overcome till 1823. But already in 1819 coal was in use in the iron-works at Moyeuvre and Hayange,[1] which had become large and important establishments.

When France lost the Saar coalfield in 1814 and 1815 it was a severe blow to the industries of Lorraine ; but the second wave of industrial progress, which swept over the plateau in the fifties, resulted in the discovery of coal near the frontier, at Kleinrosseln, Spittel, and Carling. This coalfield, a continuation of the Saar field, was at once energetically exploited and assisted materially in the further development of the metallurgical industry.

The improvement of communications, which took place later in Lorraine than in Alsace, was the immediate cause of this industrial movement. The Paris–Strasburg line was opened in 1853, and the Metz–Thionville branch in the following year ; in 1853 too the Marne–Rhine canal was finished. Between 1852 and 1856 the horse-power of steam employed in the department of Moselle multiplied by three, the output of iron and steel by more than two.[2] This placed the Moselle at

[1] *Teste* Chaptal, *De l'industrie française*, Paris, 1819.

[2] Some details of this development are appended. A large number of works still in existence were built at this period : Gorcy in 1832, Champigneulles 1847, Longwy-Bas 1840–63, Frouard and Pont-à-Mousson 1856, Mont St. Martin and Prieuré 1865, Liverdun 1866. It was between 1859 and 1869 that coke-fired furnaces finally superseded charcoal-fired in Lorraine.

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the head of the departments of France for the production of iron ; and the building of the Lille–Thionville railway indicated the recognition, in the industrial north of France, that Lorraine was the future source of the iron-supply. The Collieries canal, joining the Moselle to the Saar, was constructed during the next decade (1866).

The years 1850–60 were thus crucial in the history of northern Lorraine. Up till that time the iron industry had been a comparatively small concern, existing in the midst of a prosperous agricultural country-side whose population was everywhere rising. After 1850 the conditions abruptly changed. The railway came; the iron-works suddenly and enormously increased ; the agricultural population began to decline, while that of the metallurgical and mining centres intensified its rate of increase. Industry was concentrated in the valleys of the Briey plateau, but it had also spread to the coalfield ; the Wendel family built in 1853 a complete manufacturing town at Styring, near Kleinrosseln, which lasted till 1898, when the works were removed to Moyeuvre and Hayange.

By 1870 the effects of this great industrial advance had become well established. Northern Lorraine had definitely become an iron-producing district of high importance. The chief iron-works were situated on the left bank of the Moselle between Metz and Thionville, close to the chief mines ; but others, of later development, already flourished in the direction of Saarbrücken or were coming into existence on the Luxemburg frontier and round Nancy. The Lorraine portion of the Saar coalfield was being energetically worked and producing a quarter of a million tons per annum. And the other parts of northern Lorraine, the agricultural districts, were already showing a distinct decline in population.

At the moment of annexation the industries of Alsace-Lorraine were thus in an extremely flourishing condition. In the south the textile industry and others in part dependent upon it were daily increasing their already large output ; in the north, also decidedly on the up-grade, lay the chief metallurgical district of France. Of the two industrial areas there was no question that the Alsatian was the more important. As regards capital, plant, and revenue it greatly surpassed the other, and it was generally expected to maintain its lead.

But in point of fact these expectations were unfulfilled. The

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Lorraine iron industry, already important, soon became enormously more so, while the Alsatian textile, chemical, and engineering industries actually declined. The historical causes of these developments were as follows.

The Alsatian textile industry was thoroughly French in its relations. The free-trade policy of the Second Empire had compelled it to face foreign competition and to attack foreign markets; but, though it had reacted to this situation by the concentration of various processes in very large new steam-driven mills, it remained always primarily interested in the home market. It was, moreover, intimately connected with the rising industry of the western Vosges valleys. The Vosges, never a very serious barrier to intercourse, were already crossed by several good roads; a railway projected between Mulhouse and Remiremont was sanctioned in August 1870—after the outbreak of war—and would certainly have been followed by others; for the fact that no railway crosses the Vosges to-day is due to political, not to geographical, conditions.

Thus when Alsace was annexed by Germany the textile district of the Vosges was cut in half. On the Alsatian side were all the older establishments; on the Lorraine side all the newer. It followed that, if the proprietors of the older establishments wished to keep in touch with the French market and to remain under the French flag, the opportunity was at hand either to remove their works to the rapidly developing textile district across the Vosges or at least to build a branch establishment there.

The result was a great migration, here of capital, there of population as well. Many concerns abandoned Alsace bodily and transferred themselves, workmen and all, to the valleys of Lorraine. Many others built new factories on the Lorraine slope. It was an opportunity for laying down new plant; and the protectionism of the Third Republic not only favoured the new foundations but created new conditions to which the great multiple establishments of Alsace were less suited than a smaller and more specialized type of mill.

The generation following 1870 thus saw a comparative stagnation, in some cases a positive retrocession, in the industrial life of Alsace, together with a greatly stimulated industrialism in the adjoining parts of France. Belfort was especially affected. Cotton-mills making sewing-thread were established

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here after the war, and at the same time the *Société alsacienne des constructions mécaniques* set up large works; the population doubled in five years and increased five-fold between 1870 and 1910. In the same period the canton of Épinal multiplied its population by three, that of St. Dié by two. These great increases of population on the French side of the frontier were balanced by diminutions[1] in the industrial districts on the German side. The losses of Alsace were, however, greater than the gains of Lorraine; for many Alsatian industries, when they moved to French territory, went farther afield than the other side of the Vosges. Thus the woollen industry of Bischweiler was transplanted to Elbœuf, where it still flourishes.

The ironmasters of Lorraine could not move their mines out of the annexed region; nor could they afford the customs expense of bringing both iron-ore and coal across a frontier into French territory. They had therefore to remain where they were. The annexation transferred all the mines and iron-works to Germany except a few, comparatively unimportant, in the neighbourhoods of Longwy and Nancy. The advantage thus secured to Germany was immensely increased when, in 1879, the Thomas-Gilchrist process made it possible to produce good steel from the phosphoric *minette* ore. This discovery converted millions of tons of useless stone into good ore, exceptionally valuable owing to the ease with which it could be won and smelted. The Wendel works at Hayange installed their first basic converter in 1882, and from that year dates the third great advance in the industrial life of northern Lorraine.[2]

Ten years after the annexation therefore it appeared that, though the Alsatian textile industry had in great part slipped through Germany's fingers, she had made good her hold on the iron industry of Lorraine. The next few years, however, showed that this was not the case. The systematic exploration of the Briey plateau first revealed the prolongation of the

[1] In some cases the diminution is absolute; in others it is a diminution relatively to the normal natural increase of the population. See, for the whole subject, Chapter VII.

[2] The lead of Wendel & Co. was followed by the Longwy Steel-Works, uniting with the blast-furnaces of Prieuré and Mont St. Martin. The basic steel-works of Micheville and Pompey began work in 1895, and were followed by those of Montataire, Homécourt (1899), Neuves-Maisons, and Longwy-Bas.

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minette beds in French territory in 1884. In 1893 the first mines were opened; in 1902 mining operations on a very large scale had begun.

This event exercised an immediate influence on the iron industry. It was soon evident that the newly discovered French beds were richer than the German, and together made up a much larger total reserve of ore than was contained in the annexed deposits. The result was by a curious irony parallel to that which had already taken place in the case of the Alsatian textile industry; in Lorraine too the annexed industries began to be outstripped by an enormous new industry of the same kind, growing up in the territory that had remained French.

In northern Lorraine, as in the Vosges valleys, the new conditions were reflected by the movement of the population. The conditions of the industry, as we saw, made it impossible for the annexed iron-works to move bodily into French territory, and thus the absolute decline of population which we found in the Alsatian valleys is not repeated on the left bank of the Moselle. But whereas the population of the annexed ironfield shot up by 60 per cent. during the nineties, as a result of the new basic process, this increase was checked just about 1900, when the great rise in the neighbouring French cantons began. The year 1911 found the population-curve of the annexed ironfield already approaching the horizontal, while that of the adjoining French field was trending more and more steeply upward.

Important conclusions may be drawn from this short sketch of the industrial history of Alsace-Lorraine. German authors generally assume that the prosperous condition of these industries depends on the connexion of Alsace-Lorraine with Germany; that they were mostly created by Germans to meet the needs of the German market, and that Germany has thus a moral right in them; and that the reannexation of Alsace-Lorraine to France would mean such a disorganization of the country's industrial life as must be against her interests.

These assertions are not confined to German statements. They appear in numerous English books. One of the latest English works on Alsace-Lorraine (*Alsace-Lorraine, Past, Present, and Future*, by Coleman Phillipson, M.A., LL.D., Litt.D., of the Inner Temple, Barrister-at-Law; London, 1918) contains

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the remark (p. 261) that 'the great metallurgical development of Lorraine, like the progress in the Alsatian industries, is due to German brains, energy, and capital'.

The truth is the exact opposite. Of the capital involved in the great industries of the Reichsland only a small proportion is German; the very great bulk is, and always has been, French.[1] Doubtless the names of Wendel, Hunolstein, Dollfus, Mieg, Koechlin, Lang, and Schwartz are etymologically Teutonic. But the bearers of these names, from the dates when their families first appear in the light of history, have always regarded themselves as Frenchmen. They founded their fortunes under French rule, and it was not by their wish that Alsace-Lorraine passed into the hands of Germany. The annexation was a blow to their pockets as well as to their patriotism; and the industries of the Reichsland as a whole have never, since that moment, fulfilled their earlier promise of prosperity. The iron industry alone has undergone a great development. This was due to English brains—since German metallurgists added nothing to the original Thomas-Gilchrist invention—in conjunction with the capital and enterprise of a French firm (*Les petits-fils de François de Wendel et Cie*) which introduced the basic process, within three years of its invention, in their works at Hayange—works which, like almost all the metallurgical and textile establishments of the Reichsland, were from 1914 to 1918 subjected to sequestration as French property.

Thus, in opposition to the statement quoted above, it may be laid down that:

1. The industries of the Reichsland were created by French subjects under French rule, and the capital involved in them is still mostly French.

2. Under German rule they have for the most part failed to develop. There has been a general stagnation, while the corresponding industries on French territory have made great progress.

3. The one exception to this general stagnation—viz. the expansion of the iron industry—was neither due to German industrial skill nor to the enlightened character of German rule. The invention which made it possible was English, the capital which executed it French.

[1] See the section below, entitled 'French Capital in the Reichsland Industries'.

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4. Even in this case, the development of the unannexed territory promised before the war to outstrip that of the annexed.

It is not maintained that the reabsorption of the Reichsland industries in France can be accomplished with perfect ease. Much readjustment will doubtless be necessary. But this is in any case inevitable, seeing that the iron-works have in great part been dismantled, and all the French-owned establishments—that is to say, most of the establishments in the country—subjected to a régime of sequestration whose avowed object[1] was to damage the interests of the owner and dilapidate his property as far as possible.

French Capital in Reichsland Industries

There are no published statistics giving the amount of French capital invested in the Reichsland. Evidence on this head is, however, available in the form of official German lists, published during the war, of sequestrations of enemy property. Such lists contain about 120 industrial concerns in the Reichsland, excluding on the one hand real property owned by French subjects, and on the other French capital invested in banks and therefore escaping sequestration.

The most important French firm in Alsace-Lorraine figuring upon these lists are the Hayange iron-works, *Les petits-fils de François de Wendel et Cie.* The Wendel firm owns collieries producing 2·4 million tons of coal per annum, and its blast-furnaces at Hayange have an annual output of 800,000 tons. Another mining and ironworking firm of the same class is that of the Comte de Hunolstein, at Ottange.

French capital plays an enormous part in the Alsatian textile industry. The families of Lang, Jourdain, Mieg, Dollfus, Schwartz, Hartmann, Spetz, Gast, Blech, Koenig, and others,

[1] As laid down by some at least of its most responsible administrators. 'Il est du devoir de l'administrateur de guerre allemand de porter atteinte aux intérêts des entreprises qui lui sont confiées.' F. Eccard, *Biens et intérêts français en Allemagne et en Alsace-Lorraine pendant la guerre*, Paris, 1917; p. 71, quoting Professor Rehm, of Strasburg University (faculty of law). 'Le principe dominant auquel les administrateurs doivent obéir est non de conserver mais de nuire' (ibid., from the same source). Both quotations are from a written article on the subject by Professor Rehm, who has himself acted as administrator for several large French concerns in Alsace.

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controlling between them almost the whole cotton industry in Alsace, are entirely French. The mills at Masmünster, Thann, and Wesserling are exclusively French concerns; and most of the capital sunk in the spinning, weaving, bleaching, dyeing, and printing of cotton at Mulhouse, Altkirch, Colmar, and Schlettstadt, and in the districts of Gebweiler, Münster, Markirch, and Schirmeck, is French. The Lorraine plush-mills are French also.

The most important metal-working firm in Alsace-Lorraine is the *Société alsacienne des constructions mécaniques*, with large establishments at Mulhouse and Grafenstaden, as well as a great branch establishment at Belfort. This, one of the largest and best-known engineering firms on the Continent, is a French concern; its capital amounts to over 13,000,000 francs. Other metal-working firms of French nationality are Messrs. Quinchez, at Kreuzwald (*Kreis* Bolchen; steel-works); Messrs. Grün, at Gebweiler (mechanical construction); Messrs. Kolb, at Strasburg; Messrs. Coulaux & Co., at Molsheim; and Messrs. Haffner, at Saargemünd (safes).

Other French concerns are the great glass-works of St. Louis and Vallérystal, the potteries at Saargemünd and Niederweiler, the chemical works at Dieuze, Mulhouse, and Thann, the hat-factories at Saarunion, the Altkirch tile-works, the gas-works at Strasburg, Mulhouse, and Saarburg, several of the preserved-food factories and tobacco factories, &c.

It is difficult to estimate the total French capital thus accounted for. It certainly amounts to several hundred million francs. But estimates differ widely and cannot be relied upon; thus the total of French capital in Alsace-Lorraine a little before the war was estimated at 1,000,000,000 francs, but it appears that the French landed property in the Reichsland is by itself equal to 1,500,000,000 francs.[1]

The Supply and Prices of Coal in the Reichsland

The main sources of coal-supply for the Reichsland are the Ruhr and Saar-Lorraine fields. Thus at Strasburg Saar coal sells at about 22*s*., Ruhr coal at from 20*s*. to 32*s*., including

[1] A detailed and extremely interesting account of the way in which French capital in Alsace-Lorraine was treated during the war by the German authorities will be found in F. Eccard, *Biens et intérêts français en Allemagne et en Alsace-Lorraine pendant la guerre* (Paris, Payot et Cie, 1917).

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industrial steam-coal at 20*s*. and 22*s*., and anthracite at 30*s*. to 32*s*. Belgian coal, at prices varying from 21*s*. to 30*s*., is also used; and lignite briquettes from Cologne fetch 21*s*.

At Mulhouse the ruling prices are distinctly higher. Belgian coal is 34*s*. to 38*s*.; anthracite about 40*s*. Saar coal on the other hand is cheap (20*s*.). At Metz cheaper supplies are available. Lorraine coal is about 20*s*. to 22*s*.; and briquettes, both from the Ruhr and from Belgium, at about 21*s*., are much in use.

These prices should be compared with those ruling near the source of supply, in order to appreciate the difficulties which they impose upon industry in Alsace-Lorraine. Ruhr coal can be bought in the towns of the lower Rhine at 11*s*. to 22*s*.; the prices vary a good deal, but are in general highest for anthracite and lowest for dry and bituminous coals. In some places even lower prices are found; thus at Elberfeld-Barmen 10*s*. or even less is the average price of some varieties. At Cologne no Ruhr coal fetches much below 14*s*.; at Düsseldorf about the same; at Bonn about 15*s*. is the minimum. Higher up the river the prices increase regularly. At Mainz the cheapest Ruhr coal is 18*s*.; at Frankfurt-am-Main 19*s*. (a great deal of English coal at about 21*s*. to 23*s*. is burnt at Frankfurt); at Mannheim on the other hand, where great quantities of coal are unloaded from barges for distribution over southern Germany, the cheapest kinds are only about 17*s*. At Strasburg 20*s*. is the minimum; and farther south, at Mulhouse, Ruhr coal appears hardly to be used at all. Thus Ruhr coal is approximately 10*s*. a ton dearer at Strasburg than on the lower Rhine—a rise which doubles the price of the cheapest varieties.

Saar coal has much less influence on the German market than Ruhr coal. At Saarbrücken it fetches 11*s*. to 17*s*.; but it is seldom met with at any great distance from the pit. The cheaper varieties are sold in Strasburg at about 7*s*. above their Saarbrücken price, and at Mulhouse and Metz at about the same figure or rather less; but outside Alsace-Lorraine this coal is only used in any quantity on the right bank of the Rhine and in the Palatinate. Thus at Kaiserslautern it is the chief source of supply and fetches 15*s*. to 18*s*. a ton; at Ludwigshafen, though apparently not at Mannheim, it competes with Ruhr coal; in the neighbourhood of Mainz, Wiesbaden,

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Frankfurt, &c., it is about 17*s*.; and finally farther south it is almost the only coal available, being about 17*s*. as against 19*s*. for Ruhr coal at Heidelberg, and 15*s*. to 25*s*. as against a minimum of 22*s*. for Ruhr coal at Freiburg-im-Breisgau.

Finally, lignite briquettes from the Brühl field near Cologne,[1] which fetch a price in Alsace-Lorraine equal to that of pit-coal (though their efficiency is considerably less), are sold at 7*s*. at Cologne, 14*s*. at Coblenz, 17*s*. at Ludwigshafen, 18*s*. at Frankfurt-am-Main, and as much as 35*s*. at Freiburg-im-Breisgau. This form of fuel is therefore, on account of its bulk, very expensive to transport over long distances, even in the form of compressed briquettes.

Mining, Metallurgy, Quarries

Lower Alsace.—Mining was once a considerable industry in Lower Alsace; it has, however, almost entirely vanished during the last hundred years. At the beginning of the nineteenth century the district contained twenty-nine iron-mines, now all shut down; the last, at Dauendorf, was working down to the time of the German annexation.

The fortunes of metallurgy in Lower Alsace have followed those of mining. Blast-furnaces, charcoal-fired, existed at most of the mines and were shut down as the mines fell out of use. The last charcoal-fired blasts survived as late as the seventies in the Jägertal (Niederbronn, Merzweiler), but succumbed to competition after the annexation. At present there are a few steel-works operating in connexion with such industries as tool-making, ironmongery, and so forth; these are mentioned below under the heading of metal-working industries.

Lignite was formerly mined in the Lower Alsatian plain near Buchsweiler, under the Bastberg hill; it was used for the extraction of chemicals, since its high content of iron, gravel, and clay made it useless for burning. It has not been worked since 1882.

Certain attempts have been made from time to time to reopen the old mines of the High Vosges, notably at Urbeis in the Weilertal, where antimony was the chief object of exploitation.

[1] For a description of this large lignite-field and its output see *Manual of Belgium* (I. D. 1168), pp. 384-5.

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The only mining industry of any importance in Lower Alsace is its petroleum wells (described above in Chapter XIII). The oil is conveyed in pipe-lines or barrels to the neighbouring refineries, of which there are several, including a large establishment at Biblisheim.

Quarries are mostly on a small scale : on average they occupy only about four or five men each. They are about equally divided between sandstone quarries in the Vosges and limestone in the plain. Tile-works are found everywhere, but as a rule they work for the local market only ; the same is true of potteries. Fireproof wares and special crucibles for chemical works are made in the northern part of the plain.

Upper Alsace.—This was once an important mining area. Numerous workings in almost every one of the Vosges valleys exploited the various ore-veins in which the High Vosges are rich. Many are known to have been worked on a considerable scale as early as the tenth century, and throughout the Middle Ages and succeeding centuries mining was vigorously prosecuted in these valleys. The main centre was Markirch, where silver was the chief object of exploitation. From the tenth to the end of the eighteenth century these mines were working, and often produced large quantities of metal. Thus in 1530, and again in 1539, single masses of silver were found weighing two and three hundredweights respectively. In addition to the silver-mines of the Markirch district there were numerous and valuable mines of copper, lead, zinc, and iron. Lead was worked in the Markirch valley and at St. Pilt; copper especially in the southern valleys (Doller and Thur) ; manganese, arsenic, and coal at various sites.

All these mines, with a few exceptions of no great importance, fell out of use during the nineteenth century. The German annexation was followed by legislation (1873) designed to stimulate mining ; and this resulted in renewed activity during the next few years. Seven concessions were taken up in 1874, and 59 in 1875. The movement was not permanent ; it was a mere flicker which died away almost immediately after wasting a good deal of money. Only a few workings brought any return ; such were the Antonie lead-mine at Steinbach (400 cwt. ore 1877, 600 cwt. 1878, nothing in 1879, shut down 1880) ; the Adele copper-mine at Wesserling (600 cwt. good copper pyrites 1877, shut down 1878, reopened

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and 50 tons won 1882, shut down again 1885); the Elisa copper-mine at Mollau (50 tons pyrites 1881, 250 tons 1882, shut down 1885, unsuccessfully reopened 1889); the Aurora copper-mine at Moosch, which after long and unprofitable exploration at last in 1897 yielded a lead-ore (galena) with small percentages of copper and silver. About a dozen small coal-deposits were tried, but they proved unprofitable.

The mining movement of the seventies was thus a mere experiment, and an unsuccessful one. Payable ores were nowhere found in such quantities as to justify the continuation of work. Even the rise in copper at the end of the eighties, though it stimulated a renewal of the experiments, did not bring any of the workings within the margin of profit.

On the other hand a revival of silver-mining took place about 1900, and by 1910 the yearly output had reached 200 tons of ore worth £3,000. This is at present the only vestige of the once great mining industry of the southern Vosges.

The potash-mines of Upper Alsace, first exploited in 1909, had already before the war become the leading mineral industry of Alsace. An account of the deposits has been given in Chapter XIII.

Quarrying has always flourished in Upper Alsace, owing to the number and variety of its rocks. All along the line of the foothills limestones and sandstones are quarried; of the latter the most famous is the yellow Rufach sandstone, of which the mediaeval churches at Thann, Rufach, and Colmar are built. In the mountain district granite, gneiss, and grey-wackes are quarried for building and for road-metal. Potter's earth is found in a number of places, notably Colmar, Mulhouse, Sierenz, Pfaffenheim, Hattstadt, and Uffholz; and deposits of brick-earth are quite common in the foothills. Peat is found in the old lake-beds of the Vosges; the German forestry service has recently begun to exploit it.

The quarries of Upper Alsace employ about 150 hands; lime-kilns employ about 170, many of whom are primarily engaged in other trades, e. g. tile-making. The last-named industry employs 700–800 hands, including those engaged in extracting the raw material.

Pottery is important at Altkirch and Illfurt, where a French company has large tile and earthenware works. Otherwise there are also numerous little local tile-works (about 100).

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Another large ceramic works is situated at Sufflenheim, near Selz; and pottery and tiles are also made in large quantities at Dannemarie (Dammerkirch).

German Lorraine.—These industries hold a very important place in German Lorraine; in fact this is one of the chief mining and metallurgical districts of Europe. The deposits of iron-ore, coal, and salt have been already described above (Chapter XIII, pp. 308–312 and 315–7); here it is only necessary to make a few remarks about the industries based on them.

Iron-mining and smelting have been established in north-western Lorraine since a very distant period. The Hayange works had been in operation several centuries when they came, in 1264, into the possession of the Counts of Luxemburg. In 1711 they were bought by Johann Martin Wendel, a native of Trier; during the Revolution they were declared State property, but were bought up in 1803 by François de Wendel, who added to his possessions the works at Grande Moyeuvre in 1811 and those at Rosslingen in 1816. His son Charles built in 1853 the works at Styring (Styring-Wendel) and in 1856 constructed the collieries at Petit Rosselle. The Styring works, as mentioned above, were closed in 1898.

At present the great majority of the iron-workers in Lorraine are in the employment of the Wendel firm. In the year 1894 the Wendel works employed 5,600 out of a total of 7,900 iron-workers for all German Lorraine. The Wendel works are still situated at Hayange, Grande Moyeuvre, and Rosslingen; they include blast-furnaces, Thomas steel-works, puddling furnaces, forges, rolling-mills, &c. Other blast-furnaces, steel-works, &c., are at Rombas, Uckange, Redange, Audun-le-Tiche, Maizières, and Ottange; the Ottange works, like those of the Wendel firm, are French property. There are puddling furnaces and forges at Ars-sur-Moselle.

All these works are on the left bank of the Moselle, either in or on the edge of the *minette* field. But the forests of eastern Lorraine once supported a number of furnaces and forges, and one or two of these still survive. The most important is at Mutterhausen. It lies among the Low Vosges, in the Zinsel valley south of Bitche, in *Kreis* Saargemünd. The iron and steel-works were founded in 1623 and extended in 1723; by the end of the eighteenth century they included two blast furnaces and several forges and foundries at nine different sites.

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They were bought up and enlarged in 1843 by Dietrich & Co. of Niederbronn, and had a period of prosperity, during which they made axles and tires for all the French railways. In 1870 the works employed 1,000 men; but they never recovered from the blow of the annexation, and have languished ever since; the number of men employed dropped by more than 50 per cent. in the first twenty years. At present they possess two Martin furnaces, nine puddling furnaces, a cupola furnace, forging and casting plant, &c. About 15 or 20 per cent. of the total power used is water-power.

The output of *minette* in relation to the ore-supply of Europe and the world has been already discussed (p. 308). The output of pig in the Reichsland was 2·7 million tons in 1910; this was almost all *minette* iron mined and smelted in the north-west of Lorraine. Of the iron-ore mined in the country, however, only about half is smelted on the spot; the rest goes in equal quantities to the Ruhr district, the Saar valley works, and Luxemburg. (At the outbreak of war the yearly output of *minette* in German Lorraine had grown above 21,000,000 tons; about 11,000,000 were smelted in Lorraine, which would produce nearly 4,000,000 tons of pig.)

The pig so produced is analysed as follows: about 71 per cent. is consumed by Thomas converters, 2 per cent. by puddling furnaces, and 17 per cent. is made into cast-iron. Thomas steel is thus by far the most important product of the Lorraine metallurgy.

The total number of blast-furnaces is 58, of which 53 were actually working in 1910. The conceded ironfields amount to 170 square miles.

The development of coal-mining in Lorraine has been rapid. It was not till 1856 that the Lorraine coal was discovered close to the frontier of the Bavarian Palatinate. Work was begun at once, at Petit Rosselle and l'Hôpital (Spittel), and the output has been steadily increasing ever since. The production in 1910, from three collieries, was 2·7 million tons, a figure which was rapidly rising. If the rate of increase had been maintained, 4,000,000 tons would have been extracted per annum by about 1916. We have already remarked that the Lorraine collieries are believed to have a great future before them.

The number of miners employed has risen concurrently

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from 1,800 in 1872 to 13,000 in 1910. The area of concessions is about 200 square miles.

The old-established and important salt industry of Lorraine must also be mentioned here (the deposits have been described in Chapter XIII). The industry was already a flourishing one before the Romans came; and in the Middle Ages it was a principal source of wealth in northern Lorraine. At present the output is solely limited by trade conditions, and is restricted by a syndicate. The output in 1910 was 76,000 tons. About one-fifth of this is industrially consumed; the rest is used as cooking and table salt.

Formerly there was a rock-salt mine near Château-Salins. This was, however, inundated in 1866, and since that date the same method—pumping and evaporation of brine—has been pursued in all the salt-works of German Lorraine. One of these works (*Soc. anonyme de la saline des Salées-Eaux*, at Ley) is a French concern, as are the brine-pits and the great chemical works at Dieuze.

German Lorraine contains numerous quarries. These may be divided into the sandstone quarries of the Vosges (Arzweiler, Pfalzburg, Vallérystal, Alberschweiler, &c.) and the limestone quarries farther west. These include several important works along the Marne–Rhine canal, mostly occupied in supplying material to the Saar blast-furnaces and the Lorraine chemical works, and several large quarries on the edge of the Briey plateau, where the outcropping oolite is worked for building-stone. The Jaumont quarry, on the heights above Metz, is the largest of these. Other limestone quarries are situated at Hettange, Méy, Morhange, Metzerwisse, &c., and sandstone quarries in the neighbourhood of Bouzonville. Gypsum is worked at Vic, Château-Salins, Thedingen, Metzerwisse, Rohrbach, Diedersdorf, Hellimer, &c. Gravel is dredged out of the Moselle; clay is worked principally in *Kreis* Forbach, in connexion with tile-works. These quarries employ altogether some 4,000 hands.

Lime is burnt in large modern kilns in the northern Messin; gypsum chiefly in the Château-Salins neighbourhood.

Tiles are made all over the country, but as a rule only to meet the local demand. There is, however, a large factory at Forbach and various other factories of moderate size.

Lorraine contains one large ceramic factory, viz. that of

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Saargemünd, a firm with branch establishments in Saxony, Belgium, Luxemburg, and France (Digoin). This firm specializes in artistic pottery and porcelain and in the so-called Saargemünd tiles, which are paving-tiles for outdoor use, widely employed in various countries. Fireproof pottery is also made here. As a maker of artistic wares the Saargemünd firm is well known all over the world. It was founded in 1780, and now employs some thousands of work-people and produces several million pieces annually. The only other factory of the same kind in German Lorraine is that of Niederweiler (*Kreis* Saarburg). This is a French firm (*Soc. anonyme*) established in 1754 by French artists in order to evade the monopoly granted to the Vincennes works. It made porcelain, pottery, and especially statuettes, the well-known *figurines de Lorraine*. Its most successful period was 1766–90; after the latter date it was gradually cut out by the Saargemünd factory, and it now makes only common household wares. As a French firm it has been sequestrated during the war.

French Lorraine.—The industries are much like those of German Lorraine. The metallurgical works are less developed than in annexed territory, partly owing to the more recent origin of iron-mining in the French Briey plateau, partly and indeed chiefly owing to the shortage of coal, which is the great drawback of this industry.

The iron and steel-works are divided into three groups. The Longwy group includes blast-furnaces, steel-works, rolling-mills, &c., up and down the Chiers valley on both sides of Longwy, blast-furnaces at Hussigny, and large establishments at Villerupt; farther south is a small group of works at Jœuf and Homécourt, situated on the Orne and within a mile of the frontier; and farther south again a larger group beginning below Nancy at Pont-à-Mousson, Dieulouard, Pompey, and Frouard, and extending above that town at Neuves Maisons and Jarville on the Moselle and Meurthe respectively.

The following details give the condition of these industries in 1910.

The Longwy group includes eleven firms:

The Société anonyme des Aciéries de Longwy (capital 24,000,000 francs; 6,000 hands; wages bill 10,000,000 francs; output 40,000,000 francs per annum, including 6,000,000

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exported) has works at Mont St. Martin, Longlaville, Longwy, and Moulaine, comprising seven blast-furnaces, a steel-works with basic plant, one with Martin plant, a foundry, construction shops, and rolling-mills. It specializes in steel, unworked and rolled, iron and steel castings, light rails and rolling-stock; and produces 1,180 tons of pig daily.

The Société anonyme des Aciéries de Micheville, at Villerupt (capital 16,000,000 francs; 4,300 hands employed) specializes in girders, rails and sleepers, and wire. It produces 302,000 tons of pig and 277,000 tons of steel per annum, and its annual output amounts to 31,000,000 francs, of which 8,000,000 are exported. Over half this total is manufactured steel goods.

The Société des Hauts-Fourneaux de Longwy (de Saintignon et Cie) has four blast-furnaces, as well as mines. It employs 400 hands and produces 530 tons of pig a day.

The Société des Hauts-Fourneaux de la Chiers has four blast-furnaces as well as steel-works and rolling-mills. It produces 530 tons of pig a day.

The Hauts-Fourneaux de Saulnes (Marc Raty et Cie) possesses mines, four blast-furnaces, and a cement-works. It employs 360 men and produces 380 tons of pig a day.

The Société industrielle lorraine, at Hussigny, has mines and two blast-furnaces. It employs 142 men and produces 200 tons of pig a day.

The Société des Hauts-Fourneaux et Forges de Villerupt–Laval-Dieu has two blast-furnaces and produces 200 tons of pig a day.

The Société métallurgique de Senelle-Maubeuge has five blast-furnaces, steel-works, rolling-mills, and cement-works at Longwy-Bas, and produces daily 800 tons of pig.

There are also foundries at Charency-Vezin and a boiler-factory (Chaudronnerie lorraine) at Longuyon.

The Comptoir métallurgique de Longwy is a syndicate for the sale of iron and steel products in France and her colonies; it controls the whole girder output of twenty-three French firms.

The Creusot works possess iron-mines at Droitaumont; they also depend upon Lorraine for a large supply of blooms, girders, plates, &c.

The large works at Jœuf (blast-furnaces, steel-works, rolling-mills) are the property of Wendel & Co., the French firm which owns Hayange and Moyeuvre.

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The Homécourt works belong to the Compagnie des Forges et Aciéries de la Marine et d'Homécourt. This company, with a capital of 28,000,000 francs, has its head-quarters at Saint-Chamond (Loire) and other branch establishments in the Nord and in the Basses-Pyrénées. Its mines are all in the Briey basin at Chevillon, Trieux, Anderny, and Homécourt. It employs altogether 15,000 hands, and specializes in munitions of war and railway material, which it produces to the annual value of 80,000,000 francs. Its works at Homécourt were begun in 1899 and planned to consist of six blast-furnaces (a seventh has been added) and plant for converting their whole output, calculated at 37,000 tons a year, into steel. In 1910 the actual output of pig had reached 1,300 tons per day, and the steel output surpassed that of any other French firm. The produce chiefly takes the form of blooms, billets, and all heavy and medium types of rail and girders. A Martin hearth was first lit in 1912; a second was being built at the outbreak of war.

The Nancy district is exploited by the following firms:

The Société des Hauts-Fourneaux et Fonderies de Pont-à-Mousson (capital 2,000,000 francs; 5,400 hands employed; wages bill 8,000,000 francs) produces annually pig, castings, and cement to the value of 30,000,000 francs. It is the greatest foundry in France; its output of cast-iron pipes is 70 per cent. of that of all France, and, together with that of its branch establishment at Foug, exceeds that of any other factory in the world.

The Société anonyme des Hauts-Fourneaux, Forges et Aciéries de Pompey (capital 11,000,000 francs; 3,000 hands) has its works at Pompey and at Apremont in the department of Ardennes. Its establishments at Pompey include blast-furnaces, steel-works, forges, and rolling-mills; the whole output of pig is converted into steel, which is made into rails, girders, forgings, &c. It also has at Pompey a cement-works and mills for grinding basic slag.

The Société anonyme des Forges et Aciéries du Nord et de l'Est (capital 15,000,000 francs) has two groups of works: one near Valenciennes, the other comprising iron-mines at Chavigny-Vandœuvre, Lavaux, and Pienne (Briey), and four blast-furnaces, with steel-works, rolling-mills, and basic slag mills, at Jarville. This Lorraine centre employs 1,615 men

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and produces annually a million tons of ore, 145,000 francs' worth of pig, 135,000 francs of rolled steel girders and rails, 14,000 francs of steel plates, and 20,000 francs of basic slag.

The Société anonyme des Forges et Fonderies de Montataire (Oise) has a branch establishment in Lorraine, comprising iron-mines at Frouard, Pompey, Bouxières-aux-Dames, and elsewhere, and blast-furnaces, basic converters, and rolling-mill at Frouard. It produces pig for casting, basic pig, steel ingots, &c.

The Société des Hauts-Fourneaux de Maxéville (capital 1,500,000 francs) employs 452 men and produces 645,000 francs' worth of ore, 2,200,000 francs of pig for steel-works, 1,800,000 francs of pig for casting.

The iron-works of Meurthe-et-Moselle produced in 1911 over 3,000,000 tons of pig, or 67 per cent. of France's total output; of steel ingots the department produced 930,000 tons, or half the output of France. Thus for ore, pig-iron, and steel Meurthe-et-Moselle stands easily first among the French departments. But the steel produced is almost all Thomas steel, which makes up into comparatively low-grade and cheap goods, such as rails and the heavier type of girder. Martin hearths are, however, beginning to come into favour, and the Longwy steel-works, the Homécourt works, the Senelle-Maubeuge works at Longwy-Bas, and other establishments now have them.

Apart from the iron-works of the *minette* district, French Lorraine contains an important group of establishments in the south-western district. The department of Haute-Marne possessed in 1835 no less than 52 charcoal-fired blast-furnaces and 104 forges; it was then the leading iron-working district of France. These works were situated in the valleys of the Marne, Blaise, Rognon, and Rongeant; they employed 6,000 hands and produced various kinds of ironwork, plates, utensils, &c. Between 1860 and 1869, when the *minette* field was rapidly developing, this district declined in importance, and several of the furnaces were put out; and when the works of Haute-Marne regained their prosperity it was rather as dependents than as competitors of the Meurthe-et-Moselle establishments. The local iron-mines produced smaller and smaller quantities of ore; during the nineties the reduction of output was very marked (330,000 tons 1895; 130,000 tons 1896), and the

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number of blast-furnaces has now fallen to seven. Of the ore produced about 95 per cent. is oolitic, the rest geodic.

At present this area is of importance less as a centre of metallurgy than as a district in which iron and steel from northern Lorraine are converted into machinery, castings, forgings, &c. Notes on this industry are given in the following section.

Quarries are common throughout Lorraine, especially in the mountainous south-east and the limestone west. The most noteworthy are those of the Barrois, whose Portland beds yield quantities of limestone for every purpose—building, burning, metallurgy, and lithography—and are worked in numerous quarries ; and those of Euville and Lerouville, near Commercy, where an oolite of especially good quality is won and exported in large quantities. Provenchères, near the source of the Meuse, is a large quarry-centre, producing grindstones ; these are also made at a number of places in the Vôge. Brick-earth is common, especially in the Oxford clay and the Keuper and Lias series ; and tiles are made for local purposes all over Lorraine. Lime-kilns on a large scale (150 hands) exist at Xeuilly on the Madon ; and pottery is made at many of the chief towns, e. g. Nancy, Lunéville, Rambervillers, &c.

Metal-working Industries

Under this head we include all industries in which goods are made of metal, e. g. casting, forging, machine-construction, and the manufacture of the goods generally classified as ironmongery.

Some aspects of this industry-group have been already considered in the foregoing section ; thus rolling-mills, in which rails, girders, and steel plates are produced, have been described in connexion with the steel-works to which they generally belong. This is due to the fact that a great economy is effected by transferring the material directly from the blast-furnace to the converter, and from the converter to the rolling-mill, before it has had time to cool. It therefore pays in general to have both steel-works and rolling-mills attached directly to the blast-furnaces ; and where this happens it is convenient to describe the whole establishment under the head of metallurgy. Industries which do not handle such enormous masses of heated metal can afford to remove themselves from the

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immediate neighbourhood of the blast-furnaces; and it is this type of industry which we are now to consider.

Lower Alsace.—This is one of the most important groups of industries in Lower Alsace. The largest establishment is the *Société alsacienne des grandes constructions mécaniques*, at Grafenstaden. This is a French business, founded at Strasburg in 1838 by Rollé and Schwilgué, and amalgamated in 1872 with Koechlin's engineering works at Mulhouse. Its first speciality was balances, weights, and cranes; but in 1856 it began to build locomotives, which have ever since provided its chief occupation. After the annexation the main establishment moved to Belfort, where it had a great future before it; Grafenstaden became a mere branch, employing between 1,500 and 2,000 hands. Beside locomotives and tenders the firm still makes cranes and balances, and all kinds of lifting and transporting machinery, railway material such as switches, turn-tables, &c., boilers of all kinds, and metallurgical plant, as well as machine-tools; in addition it now makes internal-combustion engines.

Grafenstaden also has important foundries, belonging to the firm Dietrich & Co., mentioned above in connexion with Mutterhausen. Their works at Grafenstaden were founded in 1685 by Johann von Dietrich, who owned mines in the Jägertal near Niederbronn. In the years 1766 to 1769 his grandson bought works at Zinsweiler, and built new foundries at Reichshofen and Niederbronn. In 1844 the firm again extended its activities by acquiring the works at Mutterhausen and Merzweiler. After the annexation a branch was established at Lunéville. The chief products are: railway-tires (Mutterhausen); castings for machines, buildings, and ornamental purposes (Niederbronn); stoves of all kinds (Merzweiler); boilers, chemical apparatus, &c. (Zinsweiler).

Strasburg and its suburbs have numerous establishments falling in this class. There are foundries in the suburbs at Neudorf and Schiltigheim; and several works in which plant is made for various types of factory—brewery plant, refrigerators, mills, and so forth. There are also works for the construction of boilers, steam engines, transmission gears, turbines, and cranes; these are situated in Strasburg (two), at Königshofen, and at Schiltigheim. Three factories in Strasburg make material for light railways; two make electrical apparatus;

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one makes ordnance. There are several carriage-works, and boat-building both in wood and iron is done ; there are a bell-foundry and a factory of kitchen-ranges ; and a number of small establishments produce table-cutlery, locks, kettles, and other coppersmith's work, and clocks. Copper kettles are also made at Schiltigheim, where in addition there are several carriage-works ; at Königshofen lead pipes and tin and zinc plate goods are made ; and a factory at Grüneburg specializes in files. Surgical and musical instruments are also made at Strasburg.

Zabern is another centre for these industries. It has a foundry and a large factory where cranes, weigh-bridges, and agricultural implements are made. Zabern also produces stoves and ironmongery (tools of various kinds), and there is a brass foundry at St. Johann close by.

At Bischweiler there are a foundry and two factories for agricultural machines and implements ; at Barr there are two factories of the same kind ; two at Hagenau ; and others at Wasselonne (Wasselnheim) and Molsheim, the latter making sickles and scythes. There is also a large hardware-factory at Molsheim. Tinware and sheet-iron goods are made at Weissenburg.

The textile-manufacturing town of Rothau on the upper Breusch has large machine-construction works after the pattern of those found in Upper Alsace, where machinery for mills (looms, water motors, &c.) is manufactured.

Dietrich & Co. have large carriage-works at Reichshofen, where, in addition to carriages of all kinds, they produce rolling-stock for railways, cranes, turn-tables, &c. At Bischheim there are large repairing-shops belonging to the German Imperial Railways.

Schlettstadt has an almost unique industry, namely the manufacture of metal-wire gauze for paper-mills, as well as for other purposes. The industry has long been established in this town ; it formerly supplied the small rectangular sections of gauze which, mounted in frames, served the purposes of the hand-maker of paper. When the papermaking machine was introduced, long endless belts of the same material were required, and these are now made by three firms at Schlettstadt. The wire, copper or brass and excessively fine, is made on the spot, and pieces up to 13 ft. wide are woven. The Schlettstadt

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works formerly exported to all parts of the world, but the German annexation dealt them a severe blow, cutting off their export trade by the high export duties. Branch establishments were created in Angoulême and at Nancy.

There are other works at Mutzig and Gressweiler, immediately west of Molsheim on the Breusch. Gressweiler has a branch of the ironmongery works (tools and hardware) at Molsheim and Klingental; Mutzig has iron and bronze foundries and makes ironmongery. It was formerly a centre for the manufacture of fire-arms.

The works at Klingental deserve special mention. Klingental ('the valley of blades') is on the edge of the Vosges, west of Oberehnheim. Here, in 1730, a certain Sieur d'Anthès created a factory of *armes blanches*, for which the French army had previously depended upon Solingen. D'Anthès, armed with a patent from the king, brought workmen from Westphalia and was soon able to produce weapons equalling those of the famous German factory. Water-power was available, and the factory was for a long time the sole source of sabres and bayonets for the royal, republican, and imperial forces. During the nineteenth century it fell into decay owing to its remoteness from lines of communication and large industrial centres; and by 1870 it had become a private concern. It still produced ceremonial and theatrical swords, and finished sabres and bayonets for the army; but it was now a mere annex of the Molsheim ironmongery works, and this it still remains. Copper fittings for blast-furnaces are also made in a foundry here.

Upper Alsace.—The metal-working industries are almost entirely dependent upon the textile industry for their existence and character. Machine-construction thrives on the building and repair of machinery for mills, and has given rise to a group of related industries, which congregate round the textile centres of Mulhouse, Thann, and Gebweiler. The first shops of the kind were built at Bischweiler (Thann) in 1818, and were followed by the large works for making spinning machinery at Gebweiler (1824: Schlumberger & Co., a firm which still flourishes) and André Koechlin's engineering works at Mulhouse (1826). By 1828 there were machine-shops at Thann, Cernay, and Massevaux. All the above had foundries and complete plant. There were also nineteen smaller workshops without foundries.

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The Mulhouse works are the greatest and most famous of all these establishments. Built for the construction of mill-plant, they were soon extended in order to build locomotives, the Koechlin family being the pioneers of railways in Alsace; and up till the annexation they were extremely prosperous. In 1869 they employed 2,425 hands at an average day-wage of 2 fr. 60, and built machinery to the weight of 6,000–7,000 tons per annum. Their thousandth locomotive had been completed in 1864. In 1872 the firm André Koechlin & Co. united with the Grafenstaden machine-construction works to become the *Société alsacienne des grandes constructions mécaniques*, establishing at the same time a branch at Belfort. Henceforth the locomotive industry was banished to the other two centres; Mulhouse confined itself in future to spinning and weaving machinery, steam engines, boilers, &c.[1]

In 1872 the revival from the war and the annexation caused a great boom in all the metal-working industries of Upper Alsace. There were twenty-seven foundries at this time, with forty-four cupola furnaces in all, ranging from the great foundries attached to the engineering works of Mulhouse or Gebweiler to small and old-established works like those at Lützel (Lucelle) in the extreme south, which had been working since 1806. In the early seventies all these were working at full pressure; but by 1875 a very severe depression had set in, and the less well-equipped establishments failed to survive it. When business became better, after 1880, most of the work was in the hands of the larger firms. Even this was only a temporary improvement, and by the middle nineties there were only fourteen foundries left. Thus on the whole, though machine-construction has been a success in Upper Alsace for supplying the local textile mills with plant, the foundries have, considered as independent businesses, been almost exterminated by the conditions that have prevailed since 1870.

Upper Alsace contains several factories, notably at Mulhouse, Münster, and Gebweiler, which devote their whole energy to spinning, weaving, carding, &c., machinery; other factories, at Mulhouse and Münster, specialize in repairs to such machinery.

Ironmongery, tools, &c., are made in some seventy factories, mostly small businesses, using little, if any, power. Similarly

[1] The official German work, *Das Reichsland E.-L.*, includes locomotives in the present output of the Mulhouse works; this is an error.

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small coppersmiths' shops are fairly common ; but lead and tin goods are produced at only one large factory in Mulhouse. There are a number of small locksmiths working by hand. The larger copper and brass foundries are mostly in the Doller and Thur valleys.

German Lorraine.—Apart from the gigantic iron and steel-works of the *minette* field, the metal-working industries of German Lorraine are insignificant. We have already mentioned the steel-works of Mutterhausen, and a similar establishment exists at Kreuzwald on the Palatinate frontier. There are a number of metal-working industries in Metz, but few of these are important. They include two small machine-shops, two iron and one brass foundries, three tinware and sheet-ironware factories, carriage-works, two wire-factories, an anvil-factory, and a famous bell-foundry.

Nails and pins, besides being made in the works at Grande Moyeuvre, are a separate industry at Châtel St. Germain, where, in addition, spiral springs, barbed wire, chains, locks, &c., are produced. There was once a lively home industry in nails, screws, pins, and chains in northern Lorraine, like that on the Meuse below Sedan (see *Manual of Belgium*, I. D. 1168, pp. 505–6) ; but this is now extinct.

Agricultural implements and machines are made at Albersch-weiler, where iron-works once existed ; at Holzingen (St. Avold) is a somewhat similar factory. There is a boiler-factory at Hagondange ; at Faulquemont various iron and steel goods, including bicycle frames, are made ; and at Saargemünd there is an important factory of fireproof safes (Hettner & Co.). At Thionville a large factory of modern date, with up-to-date electrical machinery, turns out iron and steel buildings and girder constructions.

French Lorraine.—Here again the most important metal-working establishments are those which are reviewed in the last section, attached to the mines and blast-furnaces of the *minette* field. There are, however, especially on the outskirts of French Lorraine, a number of old-established and still important metal-working industries, dating from before the modern development of the *minette* field and not yet fallen into decay, though the relative value of their output has greatly declined. These are situated on the northern, western, and southern frontiers of Lorraine, in the Ardennes, the Barrois, and the

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Saône basin respectively. The first has been described in the *Manual of Belgium* (pp. 505–6); the others are described below.

In Lorraine proper there are a certain number of forges and metal-working establishments. There are engineering works and electrical-apparatus works at Nancy, and engineering works at Lunéville; agricultural machines are made at Blâmont; ironmongery at Bussang. The Meuse valley also contains a few such factories. At Vaucouleurs there are an engineering shop and a foundry where ornamental work is done; at Commercy iron wire is made, and a few miles down-stream, at Vadonville, there is an iron foundry; and at Tronville there is a tool-factory, a branch of the large works at Ząbern.

The forges of the Haute-Marne have been mentioned above. They derive their raw materials from northern Lorraine and treat them in establishments situated in the valleys of the Barrois. The main centres are on the very edge of Lorraine, lying as they do in, or to the west of, the depression which has been taken (see p. 59, above) as the boundary between the Barrois and the Perthois. At Eurville-sur-Marne a factory, employing 1,500 hands, makes wire and rolled steel and iron goods; at Chamouilley axles are forged and agricultural machines made; at Marnaval there are 850 hands employed, in addition to 510 employed at Rachecourt, and 400 in the mines at Pont-Varin by the same company, which also owns mines at Pont St. Vincent, near Nancy. This company (*Compagnie des Forges de Champagne*) produces annually 48,000 tons of pig and 18,000 tons of rolled goods in iron and steel. The St. Dizier district includes a large number of other works of the same type, e. g. the large forges of Clos-Mortier, the foundries of the Osne valley, where statuary and objects of art are cast; and others.

Farther north, in the Barrois proper, is a group of metal-working establishments along the Ornain valley. Here various classes of ironmongery are made; the most important centre is Ligny-en-Barrois, where a great industry of mathematical instruments is situated. This is the only industry of its kind in France. The allied optical industry of Ligny is referred to in the following section; at the same town tools and ironmongery of various kinds are made. Bar-le-Duc has iron foundries.

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It remains to glance at the industries of the south (Saône basin). Here a distinction must be made between the large and recently developed establishments of Belfort and the older, smaller, and more scattered forges and works which extend all over the Vôge, the Faucilles, and the south-western slope of the Vosges.

The Belfort group consists primarily of the factories belonging to the *Société alsacienne des grandes constructions mécaniques*. Established after the annexation of Alsace, these works rapidly became among the most important in France. Their output consists primarily of machinery for mills, engines and boilers, and locomotives. Their eminence in the last respect is attested by the success of the locomotives which a few years ago they built for the Great Western Railway Company. Other industries of a similar kind have grown up in the villages surrounding Belfort (for instance, at Valdoie, immediately to northward of the town).

The western group begins at the Rahin valley, immediately north-west of Belfort, where ironmongery of various kinds is made. Plancher-les-Mines and Plancher-Bas both have works; in the latter village there is a speciality in the manufacture of watch-keys. Farther west is Val-d'Ajol, and beyond it Plombières, with forges and iron-working establishments; below Plombières, and on the same river, Aillevillers has forges. Round Bains-les-Bains is a group of iron-working villages, of which Fontenoy-le-Château, on the Coney, which makes sheet-iron goods, and Chapelle-aux-Bois, making nails, may be mentioned. Farther west again is the Darney district, where a number of villages produce ironmongery, though the activity of this region has much declined in the last few generations.

Glass-Works

This is an old-established and important industry in Lorraine; in Alsace it hardly exists at all, being in fact confined to three or four small establishments for painting and engraving at Strasburg. In Lorraine on the other hand it has existed since a very early date. The frequency with which glass objects are found in the Frankish graves of this region strongly suggests that the industry already existed before the Middle Ages. Down to the seventeenth century glass was made in

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small and movable establishments by the *Gentilshommes Verriers*, a guild with interesting privileges and customs who set up their plant and built small furnaces where the fuel-supply was good, and moved on when they found it convenient to do so, like a gang of charcoal-burners. The troubles of the seventeenth century brought this system to an end; and when the industry was reconstituted in the eighteenth century, it was localized in new and permanent factories.

The foreign relations of the early Lorraine glass-works are interesting; thus there was a good deal of connexion with Bohemia on the one hand, and on the other a Lorraine *Gentilhomme Verrier* in 1557 founded the first window-glass factory in England.

The present works are concentrated in German Lorraine, in the neighbourhood of Bitche and Dabo, with one large outlier not far from Charmes. Except for this last, all the works are in the sandstone hills of the Low Vosges, in districts where timber is plentiful.

The chief factory is that of Münztal St. Louis, 5 miles south-west of Bitche. Münztal is probably the most important factory of crystal glass in the world, and was the first place on the Continent where this kind of glass was made, in 1781. The works were founded as the *Verreries royales de Saint-Louis*, in 1767–8 (royal decree of February 17, 1767), and the original buildings, though greatly enlarged, are still standing and in use. When the crystal process was adopted it soon ousted other processes, and crystal has been since the end of the eighteenth century practically the only kind of glass produced. Up till 1870 Münztal worked in the closest connexion with Paris, whence it drew its designs and standards of workmanship; after the annexation this connexion was broken, and the factory gradually declined in importance and prosperity. Some 20 years or more afterwards a determined attempt was made to recover the former position of the works; this was done by bringing French artists into permanent residence, installing new and exceptionally large furnaces, initiating new processes such as hydrofluoric-acid engraving, &c. The personnel of the factory, numbering about 2,500, lives in the adjacent villages; the total output of glass amounts to about 4,000,000 francs per annum, of which only two-thirds go to Germany, the rest being exported.

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A mile and a half to the south are the glass-works of Meisental. There was an establishment here in the sixteenth century, but the present works were founded in 1711 by a firm migrating from the adjacent village of Sucht. The Meisental works may thus be considered the parent establishment of all the surrounding glass-works. Meisental formerly produced only common glass; but during the nineties a new line was attempted in the shape of extremely elaborate and ornamental table-glass. Every kind of device—colouring, transparent and opaque, encrusting, *craquelage*, *cloisonné*, &c.—is employed, and the colour-schemes adopted are much more complex than those of Bohemian or Venetian glass, being developed more from Oriental models. This new technique proved a great success; at first the products were mostly bought by museums, but they soon acquired a wider market. At present almost the whole staff (nearly 500 strong) is engaged on work of this kind.

The third and last establishment of this group is that of Goetzenbrück, a mile south-east of Münztal. It was founded in 1721 by the same family which had recently created the Meisental works. At first it made bottles and table-glass; but already in 1724 it had taken up the manufacture of watch-glasses, and by a hundred years later all other kinds of work had been given up. In 1850 Goetzenbrück began making spectacle-lenses; it had already acquired a world-wide reputation for watch-glasses, and had large agencies in Paris, London, New York, Geneva, &c. After 1871 the famous German spectacle-lens works at Rathenow ceased to manufacture, and Goetzenbrück took over the whole of their trade. At present the factory employs a thousand hands, of whom 300 are home-workers; it produces annually 80,000 gross of watch-glasses, and 400,000 dozen pairs of spectacle-lenses, beside bell-jars and glass-ware for chemical laboratories. Most of the glasses with which Swiss watches are fitted come from Goetzenbrück. Beside the main works there is a branch establishment half a mile away at Saareinsberg.

This group of glass-works is founded on the site of a very old industry; the small furnaces of the *Gentilshommes Verriers* were common in these forests at an early date; and as early as 1629 a factory was created at Sucht, which was the direct ancestor of that still flourishing at Meisental.

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The second group of glass-works is in the Dabo district. Here the chief factory is that of Vallérystal, equidistant from Dabo and Saarburg (5 miles from each). This factory was created by a Count of Lützelburg in 1707. Reconstructed in 1836,[1] it soon became one of the most important in France. At this time the chief seat of manufacture was a mile farther north, at Hochwalsch; but the two factories were united under one company in 1855, and from that date Vallérystal gradually absorbed Hochwalsch. When coal was substituted for wood-fuel a railway was built giving the works direct communication with the Saar coalfield. In 1871–2, after the annexation, a great branch establishment was created at Portieux, near Charmes, and the company was henceforth the *Société anonyme des verreries de Vallérystal et de Portieux*. In spite of this division, the Vallérystal continued to expand and flourish; it now employs some 1,450 hands and produces glass to the annual value of some 2,500,000 francs. Its output includes common glass of all kinds, as well as ornamental moulded, engraved, and cut table-glass, especially of the kind known as demi-crystal.

Close by, at Dreibrünnen (Trois Fontaines), is an important factory founded in 1848 by a single workman called Avril, who chose this remote spot as a refuge after being sentenced for poaching. At present it is a formidable competitor of Goetzenbrück, specializing as it does in the same kind of goods. Its chief produce is watch-glasses, but it also turns out considerable quantities of cut glass for table use, mirrors, &c. As a result of the annexation it declined greatly in prosperity and failed in 1887; but it was bought up and reconstituted by a new firm, and in the late nineties new departments were added for making spectacle-lenses and all kinds of optical glass. It is now a large and flourishing concern with over 1,000 hands; but its main speciality is still the manufacture, at exceptionally low cost, of watch-glasses (200,000 gross per annum). There is a small branch establishment near by, at Harzweiler.

There were other glass-works till recently in operation a few miles farther south, at Alberschweiler and St. Quirin. The Alberschweiler works consisted of a branch establishment

[1] The date 1856, given by one authority (Ardouin-Dumazet, *Voyage en France*, vol. 50, p. 23), is a misprint.

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from Vallérystal, occupied especially in the manufacture of mirrors and employing about 100 men. This was shut down in 1899. The glass-works of St. Quirin were situated at Lettembach, a bare mile from Alberschweiler and connected with it by a light railway. Here plate-glass was the chief product. The works were very old, having been founded in the fifteenth century by a prior of the Benedictine house at St. Quirin. They were destroyed in the Thirty Years' War, and rebuilt by the monastery of Marmoutier, later becoming a royal factory. Burnt down in 1800, the establishment was rebuilt as a plate-glass factory in 1830. This was in turn ruined by the annexation of 1871; it survived, in declining prosperity, till 1888, when the whole business was transferred to Cirey.

At Cirey, just inside the French frontier, the glass-works are the chief and almost the only interest of the little town, except for the lively trade in timber. The works belong to the St. Gobain glass company; they specialize in the sheets of plate-glass for shop windows and other purposes requiring sheets of especially large size.

On the Meurthe, a dozen miles south-east of Cirey, is Baccarat, a town of 7,000 inhabitants almost entirely given up to glass-working. The great factory at Baccarat employs 2,000 hands [1] and produces annually between 6,000,000 and 7,000,000 francs' worth of glass. Here crystal glass is the chief product, mostly moulded, cut, or engraved in ornamental forms. The output is considered to be of particularly good quality, especially in regard to design and workmanship; some of the glass-works in German Lorraine devote themselves to copying the designs of Baccarat.

An interesting feature of the Baccarat factory is the hostel system for apprentices. Those who come from homes not situated in the town live in a hostel accommodating 130 or 140 boys. They draw wages of 14 francs the first month, rising by francs to 20 francs at the end of 6 months. Eight francs a month are deducted for board and lodging, washing, mending, and lighting. Thus after the first six months the living-in apprentice is receiving 12 francs a month with expenses paid. Subsequent increase of wages is regulated according to

[1] Figures for 1889; but Ardouin-Dumazet reports in 1904 that the scale and character of the work appear not to have changed much in the interval.

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the quality of work done; at the end of 2 or 2½ years an apprentice is generally getting 35–38 francs per month.

Coal is procured from Saarbrücken, and a special point of the work at Baccarat is the large scale on which crystal is produced (in 20-ton furnaces) and its consequent cheapness.

Fifteen miles west-south-west of Baccarat, and twelve north by west of Épinal, is the factory of Portieux. It lies on the Charmes–Rambervillers railway, a few miles from the Moselle. Before 1871 it was a small place, a mere branch of Vallérystal; after the war it became a large establishment with 800 workmen, many of whom live in a great phalanstery on the spot.

The forest of Darney, and indeed the Vôge generally, was once a centre of glass-works, as of forges. These were only the old-fashioned small and primitive type of establishment, and did not survive the transformation of the industry by modern methods. There are a few glass-works on the western edge of Lorraine, e. g. at Fains, outside Bar-le-Duc.

Nancy has interesting glass-painting and engraving works, where Émile Gallé, an artist of genius whose name is known to all amateurs of such things, makes every kind of artistic glass-work, enamel, &c. Gallé's lead has been followed by other craftsmen, and several workshops now exist at Nancy, notably those of Daum, employing 125 men.

Chemical Works

In Lower Alsace there is only one important chemical factory, namely that of Buchsweiler. This was created in order to exploit the local deposits of lignite, which contained a high percentage of iron pyrites. The lignite was first worked in 1743; at first attempts were made to use it as fuel, but this was found impossible owing to the pyrites, and in 1805 the chemical works were set on foot in the hope of employing the lignite more usefully. Throughout the greater part of the nineteenth century the works flourished; the pyrites, on decomposition, yielded sulphuric acid which, combining with the alumina contained in the lignite and the iron oxide which was simultaneously produced, formed useful products. When the lignite was found too poor in pyrites to justify treatment by this process, it was sufficiently pure to be used as fuel. In 1881 the lignite-deposits were exhausted; but the chemical works continued in active operation, obtaining

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their raw materials from elsewhere and making such chemicals as prussiate of potassium and sodium, Prussian blue, cyanide and permanganate of potassium, oxalic acid and salts, sulphuric acid, and bleaching powder. The works employ some 240 hands; since the annexation they have established a branch at Laneuveville, the south-eastern suburb of Nancy, in order to retain their French market.

There is an establishment at Klingental for making extracts from dye-woods, with fifty hands. The old madder industry, which once held an important place in Lower Alsace, has almost entirely disappeared. Its market was in France, from which country it also got its raw material; and the annexation, combined with the development of coal-tar dyes, killed it. By the beginning of the present century there was only one small factory left, at Hagenau. There are a few firms in Strasburg which make colours, varnishes, &c.

Strasburg also contains a number of small chemical works of different kinds, manufacturing drugs, fireworks, artificial manures, candles, soap, perfumes, gelatine, and so forth. Sporting ammunition is made at Bischweiler; there are gas-works in all the chief towns.

In Upper Alsace the chemical industry is more developed. The dyeing and printing of cotton stuffs are even more typical of Upper Alsace than their spinning and weaving; and this industry early gave rise to chemical works, which have developed along with the development of the textile industry in general. Till 1807 Alsace depended upon outside sources for dyeing materials; but in that year Charles Kestner founded the first Alsatian chemical works at Thann. Here by degrees a great variety of products were made, including everything that Alsatian industry required; but the chief product was at first and has always been sulphuric acid, which is largely consumed on the spot in the manufacture of other chemicals. The greater part of the output is consumed in Alsace; but there is a considerable export trade to Paris, England, and Switzerland, and even to Russia and America. Thann has also a soap-factory.

Dyes are also made in various works at Mulhouse, Dornach, Lutterbach, Hüningen, and St. Louis in connexion with textile industries. Dornach has in addition a large manufactory of photographic goods. At Colmar (Logelbach) soap, dextrine,

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starch, &c., are made ; soap is also made at Ensisheim. Drugs are made by Kestner & Co., at Thann.

There are several large chemical works in Lorraine. The most important are at Dieuze and Saaralben. At Dieuze the industry dates from 1775 ; its chief activity consists in the manufacture of soda from the local salt-deposits. A sulphuric-acid factory, created at Moyenvic in 1823, was moved to Dieuze in 1827 and the works combined. At present the Dieuze works, owned by a French company, produce soda, hydrochloric, sulphuric, and nitric acid, ammonia, alum, calcium chloride, soap, superphosphates, and chemical manures ; they employ over 400 hands. The Saaralben works, which are still larger (over 450 hands), belong to the great Belgian Solvay company, founded in 1867 ; the Saaralben branch was founded in 1884. Soda is the chief product. The same company has another soda-factory at Dombasle. The output of the Dieuze factory alone is 60,000 tons per annum, and it is said that this could be indefinitely increased but for the control exercised by a German ring.

Another large chemical factory is situated at St. Avold (Herz & Co.). Here over 100 hands are employed, and the chief product is artificial manures. Basic slag is ground for agricultural purposes at Thionville, Saargemünd, and elsewhere. There is a large match-factory at Saargemünd. Smaller chemical works, making soap, perfumes, candles, matches, &c., are to be found in most of the chief towns ; so are gas-works.

Textile Industries

Lower Alsace.—Textiles are here relatively unimportant ; and the total number of hands employed, 13,700 in 1882, has since then been on the down-grade. Only a few branches of the industry are represented by really large works, and between a third and one-half of the employees are home-workers. The once important woollen mills of Strasburg and Bischweiler are extinct or decayed, and the only textile centre of first-rate magnitude now existing is the Breusch valley above and below Schirmeck.

Half the total number of hands employed are engaged in the cotton industry ; and of this total some 30 per cent. work at spinning and twisting, and 70 per cent. at weaving ; 30 per cent. are hand-weavers working at home.

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Cotton-mills began to be built in Lower Alsace early in the nineteenth century; the earliest was in 1825, at Hüttenheim, near Benfeld. But the great development took place in the sixties, and by the date of the annexation there were some 170,000 spindles and 4,000 to 5,000 power-looms, a number which has since then declined considerably.

There are now about ten cotton spinning-mills, mostly in the Breusch valley. The chief are at Lützelhausen and Rothau; others in the same neighbourhood are situated at Wildersbach, Natzweiler, Neuweiler, Mühlbach, and Grandfontaine. There are also mills at Andlau and Bischweiler. In almost all these cases spinning and weaving are carried on in the same establishment, and the spindles work almost entirely to feed the looms; but there is also a mill at Hüttenheim which makes large quantities of thread for export.

The weaving-mills are also mostly in the Breusch valley. The chief are Scheidecker & Co., at Lützelhausen, and Steinheil, Dieterlen & Co., at Rothau; but many other villages of the upper Breusch valley have large mills.

Some of the Ban-de-la-Roche villages, Waldersbach, Belmont, and Bellefosse, still pursue the home industry of tape-weaving which was introduced in 1813 by Pastor Oberlin; but the industry is at present in a very miserable condition owing to the competition of power-weaving and the consequent lowness of prices.

In other parts of Lower Alsace may be mentioned the great mills of Hüttenheim, which have nearly 1,000 power-looms, as well as making thread as already mentioned.

The woollen industry of Lower Alsace was before 1870 among the most important in France. At Bischweiler alone there were no fewer than 96 establishments, with 5,000 hands, 56,000 spindles, and 2,000 looms. The industry was almost entirely ruined by the annexation, and has never shown any signs of recovering. The numbers of hands employed, of spindles, and of looms have all declined by about 70 per cent. Yarn and cloth are, however, still made at Bischweiler; yarn is also spun at Biblisheim, Drusenheim, Barr, and Wasselonne.

Combed and twisted yarns are made in a large mill (Albert, Reichard & Co., 1,300 hands) at Erstein; and there are several establishments which weave mixed materials, woollen and cotton or woollen and silk. These are situated at Kestenholz

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Weiler, Markolsheim, Hagenau, and especially Lützelhausen, where the Scheidecker family have extensive mills carrying out many different kinds of work.

Flax-spinning and linen-weaving were formerly considerable home industries; they died out between 1870 and 1895. Jute was introduced at Bischweiler in 1883 and now employs 1,000 hands. Knitted cotton and woollen goods are widely made, both as a home industry and in mills at Barr, Wasselonne, Fouday, Saales, Andlau, and Bischweiler; but this industry has suffered by the loss of the French market. Hair-nets, of human hair, are extensively made in the country districts from Bischweiler to Schlettstadt. This industry employs 20,000 women and girls, who make on the average £2 10*s.* a year by it. The nets are sold at Strasburg and exported to all countries.

Upper Alsace.—With the sole exception of the Lorraine iron industry, the textile industry of Upper Alsace is the chief manufacturing activity of the Reichsland. We need not repeat here what has been said above in the historical sketch of industry in Alsace-Lorraine, but may proceed at once to describe the distribution of the chief branches of work.

The cotton industry is by far the most important. Its main centres are Mulhouse and suburbs, Thann, Gebweiler, and Logelbach, the western suburb of Colmar; but there are many first-rate establishments elsewhere.

The greatest of the cotton-spinning centres are Colmar and Mulhouse, followed by Thann, Gebweiler, Markirch, and Massevaux. In Mulhouse alone there are ten great cotton spinning-mills employing half a million spindles and 4,000 hands. The *Kreis* of Gebweiler contains about 270,000 spindles; its leading firm is Schlumberger & Co. of Gebweiler, who, together with Dollfus, Mieg & Co. of Dornach, make most of the sewing-thread that is made in Alsace. (The latter firm's thread is found in every household even in England, where it is familiar as 'D. M. C.') There are two large mills at Bühl, one at Isenheim, and others at Gebweiler and Sulzmatt. *Kreis* Colmar contains ten large mills with 225,000 spindles, the chief being Herzog's three mills at Logelbach, with 40,000 spindles; other important establishments are at Münster (Hartmann) and Horburg (Schwoerer), and at Günsbach, Türkheim, Metzeral, and Stossweier. *Kreis* Rappoltsweiler contains

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10,000 spindles, in mills situated at Ingersheim, Kaysersberg, Markirch, Rappoltsweiler, Urbeis, and La Poutroye.

Cotton-weaving is done in large mills at Mulhouse, Roppenzweiler, Gebweiler, Colmar, Günsbach, Logelbach, Winzenheim, Isenheim, and elsewhere. Round Markirch and Urbeis (Orbey) more primitive conditions survive; most of the weaving is still done by hand.

The dyeing and printing of cotton fabrics play a great part in Alsatian industry. Originally established at Mulhouse in 1746 by J. J. Schwalzer, a merchant, S. Koechlin, a gentleman of property, and J. H. Dollfus, an artist, it soon spread to Wesserling (1760), Logelbach (1775), Cernay, Thann, and Münster. By the end of the eighteenth century, long before the introduction of the power-loom, the dyeing and printing industry was already well established and prosperous. Indeed Alsace at this time led the world in the technique of dyeing and printing as definitely as England did in spinning and weaving. The above are still the chief establishments. They mostly dye woven materials; but at Markirch thread is dyed.

Though less important than the cotton industry, the woollen industry is old-established and extensive. The native wool-supply is of fair quality, but the industry now depends on imports from France, Bohemia, Australia, and New Zealand. Cloth-weaving was already well established in the Alsatian towns in the Middle Ages, and in the seventeenth century it was organized, at least in Mulhouse, as a regular export industry. Power-machinery was introduced in the early and middle nineteenth century, and great spinning-mills came into existence at Mulhouse, Bühl, and Malmerspach. Weaving is especially done in the Rappoltsweiler and Markirch districts; in the latter hand-weaving still goes on, but it is bound to give way before power-weaving in time. This is indicated by the fact that, whereas, since the annexation, the number of power-looms has not greatly declined, the number of hand-looms has fallen very considerably, while wages have gone down concurrently.

Flax-spinning and linen-weaving are unimportant. The latter was once an extensive home industry in the Thur valley, but has much declined.

Silk is spun at Colmar, Sulzmatt, and St. Amarin; there is a group of weaving and dyeing establishments in the Alsatian

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suburbs of Bâle, namely St. Louis and Hüningen, where the chief product is silk ribbon.

Lorraine.—We shall not review in detail the great cotton industry of south-eastern Lorraine. Its history has been sufficiently described above, and its distribution may be gathered from the map. Being of recent origin it is much more homogeneous than that of Alsace, and there are very few features peculiar to any one locality. It is practically all carried on in large, modern, and well-equipped mills; apart from a few exceptional cases, such as the woollen industry of Raon-l'Étape, the linen mills of Gérardmer, and the cotton-printing works of Épinal, almost all the establishments spin or weave cotton. The close historical connexion between this industrial district and that of Upper Alsace, it is interesting to observe, was not entirely severed even by the annexation of Alsace; thus the mills of Rougegoutte, north of Belfort, have always retained their connexion with Münster, and instances might be multiplied. In German Lorraine the cotton industry is almost non-existent; there is a mill at Fénétrange and one or two others. The only woollen mill in German Lorraine is one at Varize (Waibelskirchen), where flannel is made. Linen, as a home industry, still maintains a precarious existence in some parts; camel's hair is woven at Pfalzburg; rope is made at Ars-sur-Moselle.

Embroidery, and to a much smaller extent lace, is made as a home industry all over Lorraine, especially in the east and south. Every town is to some extent a centre of the trade; at out-of-the-way places, like Commercy, Mirecourt, Charmes, Neufchâteau, Dabo, and so on, it is almost the only trade that goes on at all. The larger towns, like Nancy, Metz, Verdun, Lunéville, Épinal, are well-known markets for goods of this class. The chief lace-markets are at Mirecourt and at Nomeny on the Seille.

Plush is a speciality of two towns in northern Lorraine, viz. Saargemünd and Püttlingen. Plush, as a material for the manufacture of tall hats, was invented in 1824 in England; in 1829 the Saargemünd factory was created, followed in 1832 by that of Püttlingen. The earliest hat-plush was grey or brown; the difficulty of obtaining a really black dye, which should not give either a green or red shine, especially after being heated, was overcome only at a much later date. The crux of the

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manufacture thus lies in the dyeing, and this can be carried out successfully only at a very few establishments. There are only five plush-factories of any size in the world, and those of Saargemünd (530 hands) and Püttlingen (260 hands) are the largest, producing 65 per cent. of the world's total output of plush. In 1891 a third factory was created at Saargemünd; but it succumbed to the competition of the others in 1895, owing to the decline in the demand for plush as the use of top hats became less general. Saargemünd also made velvet at one time, but this came to an end after the annexation, when the industry was exposed to the competition of Elberfeld.

Foodstuffs, &c.

These industries have a considerable degree of importance both in Alsace and in Lorraine. Preserved meat is especially made in Alsace; preserved vegetables in both countries. *Pâté de foie gras* is one of the main industries of Strasburg: there are ten factories in that town and one in Schiltigheim. The industry dates from 1762, when the delicacy was invented by Close, the cook of the Maréchal de Condé, then resident in Strasburg; it was developed as a trade on a large scale by Doyen, whose firm, founded in 1792, is still in existence. The industry, whose market lay chiefly in France, was much damaged by the annexation; but it is still important, and its products may be met with in all countries. The annual output is valued at about £100,000. Large numbers of sausages are also made in Strasburg.

Lower Alsace makes great quantities of *sauerkraut*; this industry is concentrated at and near Strasburg, at Schiltigheim, Geispolsheim, and especially Krautergersheim. Fruit and vegetables are preserved at Strasburg, Schiltigheim, and Horburg. Beet sugar is made at Erstein, and formerly at several other places also; chicory is prepared at Benfeld; chocolate at Altkirch. The cheese of Münster and the neighbouring valleys has been already noticed (Chap. XII, p. 296).

In Lorraine *sauerkraut* is widely made (e.g. there is an important establishment at Nancy). But the chief industry is the preserved fruits and vegetables of Metz, the most important manufacture of that town. Strawberries, plums, and mirabelles are specialities of this industry, which was established

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during the German occupation (Metz, 1875 : Devant-les-Ponts, 1883) and has its market principally in Germany.

Other allied industries in Lorraine are the gooseberry jam of Bar-le-Duc, the cakes (*madeleines*) of Commercy, and the confectionery of Verdun.

Strasburg and its suburbs have several important breweries. Others are to be found in many of the Alsatian towns, such as Lutterbach near Mulhouse, Markirch, Mutzig, and Zabern, to mention the most important only. In Lorraine the chief are at Nancy, at Xertigny in the Xaintois, and at Tantonville near Vézelise. Imitation champagne for the German market is made at Schiltigheim, at Zabern, and near Metz, where there are six factories, all of comparatively recent origin to meet the patriotic German demand for champagne made in Germany.

Distilling is mostly done on a small scale in Alsace ; but there is a large co-operative distillery at Benfeld, and other large establishments at Strasburg, Pfalzburg, Colmar, &c. In Lorraine little distilling is done ; but in the Vôge and the Saône basin generally it begins again, and many of the country towns, such as Fougerolles, Aillevillers, &c., have distilleries.

Tobacco may here be mentioned. There are several large factories in Alsace, notably at Strasburg, Colmar, Bischweiler, St. Croix on the Liepvrette, Lauterburg, Rheinau, Gerstheim, Königshofen, Gambsheim, Neudorf, &c. In Lorraine the industry is much less developed ; there are factories at Metz (two) and Boulay (Bolchen).

Paper-Making and Tanning

The whole of the Vosges massif is admirably adapted to the requirements of the paper industry. This industry was introduced about the beginning of the seventeenth century, and has flourished ever since. Some of the best-known old mills are now extinct, but their place has been taken by others. In all cases steam plant is now used. There are five large factories in Upper Alsace, the most important being at Napoleon's Island, near Mulhouse ; and about the same number in Lower Alsace. Most of these make brown paper ; high-class writing paper is chiefly made at Ruprechtsau, near Strasburg.

The French slope of the Vosges also has a large number of paper-mills, the largest perhaps being at Clairefontaine near Raon-l'Étape. Lorraine has also an interesting *papier-mâché*

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industry at Forbach. This was founded in 1844, as a branch of the works at Ensheim (Palatinate), where the Adt family made *papier-mâché* snuff-boxes. The business developed, and after the annexation the Forbach establishment, now the chief centre of the manufacture, built a branch at Pont-à-Mousson. Forbach employs about 1,000 hands, consumes over 1,000 tons of pulp, together with about 100 tons of lacquer and linseed oil, and produces every kind of *papier-mâché* goods, including wheels, tool-handles, surgical and other instruments, articles of furniture, insulators for electric plant, and an infinite variety of fancy goods in styles borrowed from China, Japan, Russia, &c.

Tanning in Alsace is especially concentrated at Strasburg and Barr; other tanneries of some importance are at Schlettstadt, Benfeld, Wasselonne, Molsheim, Rappoltsweiler, Colmar, and Mulhouse. There are still many small tan-yards with two or three men working in each; but large tanneries are taking their place. In Lorraine the industry has greatly declined since 1870; the only establishments on a large scale are at Metz and Lützelburg.

Miscellaneous Industries

Printing.—Printing has been done in Strasburg ever since Gutenberg made his first experiments there. Colour-printing and lithography also were developed early and successfully here, and printing is one of the very few industries which have increased instead of languishing under German rule. Official publications, which during French rule came from Paris, were, after 1870, printed in Alsace; and journalism has also developed. Over half the printing-presses in Lower Alsace are at Strasburg. Colour-printing, however, suffered severely from the effects of the annexation.

In Upper Alsace the chief centres are Colmar, where printing was first done in 1679, and Mulhouse.

Lorraine has important printing establishments at Nancy, where the works of the great publishers, Berger-Levrault & Co., are situated, and at Épinal, where colour-printing is the chief industry. The *imagerie* of Épinal—picture-books, broadsheets, and so on—is sold all over the world.

Woodworking Industries.—The Vosges are dotted with saw-mills in almost every valley, and timber is one of the chief assets of the country. It is unnecessary to enumerate even

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the largest mills, while the total number of saw-mills is probably well over 500. Industries such as joinery, turning, coopering, sabot-making, and so forth are carried on in almost every village ; and the main towns have proportionately large works for the same purposes. This applies almost as much to the Lorraine plateau, where timber is hardly less abundant than in the Vosges. Many towns make furniture on a large scale, notably Strasburg, Cernay, Saargemünd, Thionville, Ligny-en-Barrois, Neufchâteau, and the neighbouring village of Liffol-le-Grand, which has a special line in carved furniture. At Mirecourt also there is a special line ; almost the whole male population makes musical instruments—violins, violoncellos, guitars, and other stringed instruments—while the other sex works at lace and embroidery. At Schiltigheim there is a large factory which specializes in parquet flooring ; one at Breuschwickersheim makes gun-stocks.

Clothing Industries.—These again exist in all the chief towns. Some, however, deserve special mention. The straw-hat industry is located in central and northern Lorraine, extending south as far as Nancy and Lunéville, and north as far as Saargemünd. There are factories at Saaralben and Saarunion, but the work is mostly home industry. It began at Saarunion in 1830 ; the material used at first was rye-straw, but in 1840 Manila palm-leaf was introduced and soon became a great success. Up to 1870 Saarunion was the chief centre for the manufacture of Manila hats, while rye-straw was still used in the neighbouring town of Saaralben. After the annexation the Saarunion manufacturers set up numerous branch factories at Nancy and Lunéville, where the trade continued to flourish ; indeed Saarunion is now less important than Nancy. The same story applies to the similar industry of Saaralben. These industries are largely worked by women, who eke out the proceeds of a small holding by plaiting hats during the winter. For the most part the hats are plaited on German soil and finished on French, in the shops at Nancy and Lunéville.

At Saarunion and in the neighbourhood another interesting home industry is concentrated, namely the making of bead necklaces and ornaments. The beads come from Bohemia and Italy ; fish-scales are also used as imitation pearls.

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CHAPTER XV

COMMUNICATIONS

Geographical Considerations

Alsace-Lorraine occupies an important place in the route-map of Europe. Situated between the Alpine massif to southward and the Ardennes plateau to northward, it is typically a country of 'gates' or *trouées*; the gaps by which traffic can penetrate that mountain-barrier which runs from Liége to Nice are concentrated within its borders. The Ardennes are no impassable mountain system; but they are bleak, wind-swept, encumbered by vast forests and peat-bogs, and in winter snowbound for months together. The Jura and the southern Alps are real mountains, only to be crossed by passes which demand of the traveller some enterprise and perseverance. But between these two inhospitable tracts lies Alsace-Lorraine, where the barrier can be crossed almost unnoticed. From the Seine basin it is only necessary to climb the escarpment which separates Champagne from Lorraine, and the main ascent is at an end; it merely remains to cross the Meuse and Moselle valleys and to descend into the Rhine plain. From the Saône basin the journey is still easier: the Doubs valley leads gently up to the wide gap of Belfort, from which all the Rhine plain lies open.

There are three east-and-west roads marked out by nature across Alsace-Lorraine. The first and greatest, in the south, is the Gap of Belfort, which makes a complete break in the mountain system, and separates the two plains on each side of it by a scarcely perceptible watershed. These plains are the broad, open Rhine valley, running north, and the broad open Saône–Rhône valley—similar to that of the Rhine in geological structure and in its value as a traffic-lane—running south. Consequently the primary importance of the Belfort gap is for north-and-south traffic, between central and northern Germany on the one hand and southern France on the other.

The second road is the Gap of Zabern. Here the High Vosges have come to an end, and the mountain chain is reduced to

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a mere escarpment of no great height, overlooking the Rhine plain eastward and communicating directly with the Lorraine plateau to west. Farther north this escarpment has been cut into by rivers and frayed out into a wild tangle of precipices and gorges; but here at Zabern it is still intact, and the traveller from Saarburg traverses a flat and level plateau till he comes abruptly to the brow of the descent. This is one of the most natural main roads between central and western Europe: it connects Nancy and Paris with Bavaria, Bohemia, Austria, and the East.

The third gate is that of Kaiserslautern, which leads direct from Saarbrücken to Mainz. This, however, lies rather in the Palatinate than in Alsace-Lorraine.

The communications of Alsace-Lorraine with the sea are less obvious. Upper Alsace lies midway between the North Sea and the Mediterranean, but the rest of the country faces north rather than south. The Rhine gives it a magnificent water-connexion with the sea, and of late years this connexion has been increasingly developed, with important results for Alsace. But Lorraine falls rather within the sphere of the Meuse, and its natural port is Antwerp.[1] Thus Nancy, the capital of Lorraine, is 370 miles from Antwerp and over 400 from Dunkirk; Villerupt, the centre of the northern ironfield, 175 miles from Antwerp and 240 from Dunkirk. It is only in southern and western Lorraine that the influence of Havre begins to predominate over that of Antwerp.

Within Alsace-Lorraine itself communications tend to group themselves round certain points and lines. The successive Jurassic escarpments of the western plateau are formidable barriers, and, where they are broken, traffic-lines necessarily

[1] The Belgian railways have special reduced tariffs for goods exported from Lorraine by way of Antwerp. In 1912 the Belgian railways handled 4,041,851 tons (metric) of goods going to or coming from Lorraine and Luxemburg; and Antwerp shipped 914,000 tons of goods from these regions and received 393,000 tons of traffic in transit to them. Of the Lorraine goods exported through Antwerp iron and steel goods account for nearly three-quarters. The imports consist largely of iron-ore. So far Antwerp has a monopoly of the maritime trade for the Lorraine-Moselle basin; and the future of this trade is a question which is all the more vital for Antwerp as the German relations of Antwerp become less close. To put the matter simply, if Antwerp loses her German trade, her prosperity will depend very largely on trade with Lorraine; and if, as may happen, new lines of communication divert the Lorraine traffic to Dunkirk or Havre, the position of Antwerp must be very seriously affected.

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converge. The Corallian escarpment is most completely broken at Toul; here therefore roads, railways, and waterways converge into a single defile connecting the Meuse and Moselle valleys. The Bajocian escarpment is broken three times: most completely on either side of Nancy, where the gaps communicate with that of Toul, thereby making the Toul–Nancy area the strategic centre of all Lorraine; less completely at Metz and Neufchâteau, also strategic centres. It is therefore impossible to travel through Lorraine without passing through one—probably more—of these four towns.

The river-valleys of Lorraine are mostly wide, open, and flat-bottomed, as well as fairly straight; most of them make excellent lines of communication.

In Alsace communications are everywhere easy, except where (as in the cases of the Rhine and the Ill) the river-valleys are marshy and encumbered by water-channels and forest.

The Vosges, though necessarily an obstacle to traffic, are no very formidable obstacle. Especially on the Alsatian side of the High Vosges the valleys are straight and open, and lead up to easy passes. The topography is considered in detail below, pp. 395–401.

Road Communications

Main Roads

Alsace-Lorraine has three main east-and-west roads, connecting Paris with Saarbrücken, Strasburg, and Bâle respectively; four main roads following river-valleys, of which two (Rhine and Meuse) run north and south, while two (Moselle and Meurthe) penetrate the Vosges; and some half-dozen other roads of sufficient importance to be described here. It will be understood that only the most important main roads are being considered in this section.

1. *Paris–Saarbrücken.*—Leading as it does by way of the Kaiserslautern gap to Mainz and Frankfurt, this is the most important route between France and central Germany. North of it there is no road of equal importance till the Maubeuge–Liége–Cologne route is reached.

Approaching Lorraine by Meaux, Montmirail, and Châlons-sur-Marne, this road crosses the Aisne and enters the forest of Argonne at Ste. Menehould. It then crosses the Aire valley at Clermont and descends easily to Verdun, after which it crosses

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the Côtes de Meuse by steep gradients, traverses the Woëvre, and drops sharply to Metz. Here the gradients become easier ; the road runs east over the rolling Messin to St. Avold and then north-east to Forbach and Saarbrücken.

2. *Paris–Strasburg.*—This, the Zabern route, is the great road from France to southern Germany—Baden, Württemberg, and Bavaria. Beyond Strasburg it is connected with the upper Danube by means of the Kinzig valley traversing the Black Forest massif.

The road leaves Paris by way of Coulommiers and the Grand Morin valley to Fère-Champenoise, and crosses the Marne at Vitry-le-François. At St. Dizier it begins to climb the Barrois plateau, dips steeply to cross the Saulx and Ornain, the latter at Ligny-en-Barrois, and rises again to descend into the Meuse valley at Void. It then traverses the Toul gap and climbs to the Haye plateau, which it traverses through forest, and descends abruptly to Nancy. Leaving Nancy it crosses the flat plain of the Seille by way of Vic, and a few miles later begins to rise, gently at first, to Pfalzburg. Hence the descent to Zabern is short and abrupt, and there are then three good roads (*a.* Zorn valley by Brumath ; *b.* direct by Landersheim ; *c.* by Marmoutier and Wasselonne) to Strasburg. The highest point in the crossing of the Vosges is only about 400 metres, not much higher than that reached on the Barrois plateau.

3. *Paris–Bâle.*—This route, passing through the Gap of Belfort, is the main line of traffic between France and the north of Switzerland, with the upper Danube basin.

The road leaves Paris in an east-south-easterly direction, reaches the Seine at Nogent and follows it up as far as Troyes. Here it turns eastward over flat country to Bar-sur-Aube, beyond which it rises sharply, encountering the western edge of the Lorraine–Langres plateau. It runs over the plateau to Chaumont-en-Bassigny, where it reaches the upper waters of the Marne. It follows the Marne up to its source at Langres, and soon afterwards begins dropping into the Saône basin. After passing Vesoul it begins to rise, and between Lure and Belfort it reaches an altitude of 480 metres in crossing the extreme southern spurs of the Vosges. From Belfort it proceeds eastward over flat country to Dannemarie and Altkirch, and then climbs over the watershed of the Sundgau plateau

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(about 420 metres) to drop into the Rhine valley just below Bâle.

4. *Meuse Valley Road.*—This is a north-and-south road of some importance, following the roomy and level Meuse valley for its whole length and seldom presenting anything like a gradient, except where, as at St. Mihiel, it strikes across a spur which the river flows round, or where, as between Commercy and Vaucouleurs, it cuts across country in a straight line to avoid a bend in the course of the valley. It supplies direct communication from Sedan through Stenay, Verdun, Commercy, Void, and Neufchâteau to Langres.

5. *Moselle Valley Road.*—Entering Lorraine at Sierck this road runs through Thionville and Metz, and after following the Meurthe from Frouard to Nancy rejoins the Moselle at Flavigny. It follows the river up for another 60 miles of hardly perceptible rise to St. Maurice, where it divides, the right-hand branch rising abruptly to over 1,000 metres, crossing a shoulder of the Bâlon d'Alsace near its summit, and dropping with almost equal abruptness to Giromagny and Belfort, while the other branch follows the Moselle to Bussang and there climbs to the Col de Bussang, leading down into the Thur valley at Wesserling, and so to Thann and Mulhouse.

6. *Meurthe Valley Road.*—This is a branch of No. 5, which it leaves at Nancy to proceed by St. Nicolas-du-Port and Dombasle to Lunéville. Thence it ascends the Meurthe to St. Dié with a gentle and monotonous rise. From St. Dié one branch continues up the Meurthe to Fraize, then crossing the Col du Bonhomme and descending to La Poutroye and Colmar; the other and more important branch (left) crosses the Col de Ste. Marie and leads to Markirch and Schlettstadt.

7. *Rhine Valley Roads.*—Here there are two parallel roads, not counting those on the right bank of the Rhine. One, the more direct, follows the gravel terrace on the left bank of the river; the other bends farther to the west in order to touch the chief centres of population. The two roads meet at Bâle, at Strasburg, and again at Landau, outside Alsace.

(*a*) The river road, leaving Bâle, passes through a series of villages strung out along the bank of the river. Some of these villages have grown into small towns: Hüningen under the influence of factories; Neu Breisach because of the Rhine-crossing here; and Markolsheim as the centre of a somewhat

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isolated agricultural district; otherwise nothing of much over a thousand inhabitants is passed till the road, always absolutely flat and generally straight, reaches Strasburg. Hence it continues in much the same way till it passes the frontier at Lauterburg.

(*b*) The western road is equally level. It traverses the Hart forest and leaves Mulhouse on the left; picks up the Ill at Ensisheim, and proceeds to Colmar, Schlettstadt, Benfeld, Erstein, and Grafenstaden, immediately after which it joins the river-bank road and enters Strasburg. Beyond Strasburg it runs north to Brumath, and then direct to Hagenau and Weissenburg, where it crosses the frontier.

A few roads of first-rate importance remain to be described.

8. *Metz–Strasburg.*—There are two lines, northern and southern.

(*a*) The northern road follows No. 1 to St. Avold, and then branches off south-east to Saaralben and Saarunion, finally joining No. 2 at Pfalzburg, and so proceeding by the Zabern road to Strasburg.

(*b*) The other alternative runs direct from Metz to Château-Salins, joining No. 1 at Moyenvic. The terrain is rather hilly, though the hills are not high.

9. *Chaumont–Nancy.*—This road runs by Andelot, St. Blin, and Liffol-le-Grand to Neufchâteau, and then proceeds along the Oxfordian plain (Soulossois) to Colombey, and through the Haye to Pont St. Vincent and Nancy. Except in the last few miles it is a very level road.

10. *Château-Salins–Saargemünd.*—After crossing a hill (over 300 metres) north of Château-Salins the road descends to level ground and proceeds without incident to Gros Tenquin and Püttlingen, thence to Saargemünd. This road, in connexion with parts of Nos. 1, 9, and 4, gives a direct line from the south of France through Langres to the Saar and the Gap of Kaiserslautern.

11. *Belfort–Colmar.*—The road skirts the Vosges foothills, passing through Cernay (Sennheim), Isenheim, and Rufach. In connexion with roads following the Rhine and Doubs valleys, this route forms a most important link between all northern and central Germany on the one hand and all southern France on the other. It is perhaps the most important of the various roads which pass through the Gap of Belfort.

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Chief Centres of Road Traffic

The topography of Alsace-Lorraine inevitably concentrates a large proportion of the traffic at certain nodal points, as explained above. Here we are concerned only with the actual developments which have taken place at these points.

The main road-centres are Metz, Nancy, and Strasburg. It is difficult to say which of these is the most important. The supremacy of Strasburg is due not solely to its position as a traffic-centre, but rather to its position as capital of the rich and fertile Rhine valley; while the predominance of Nancy over Metz is largely due to the German annexation of the latter town.

The main roads radiating from Metz run up and down the Moselle, to Thionville and Nancy; across the Woëvre to Verdun; and over the Messin plain to Bouzonville, Boulay (for Saarlouis), St. Avold (for Saarbrücken and Pfalzburg), Château-Salins (for Pfalzburg), and Nomeny. Most of them thus trend eastward.

From Nancy first-class roads run down the Moselle to Metz; over the Saulnois plain to Vic (for Pfalzburg); up the Meurthe to Lunéville for St. Dié, and up the Mortagne to Gérardmer; up the Moselle to Épinal (for Thann and Belfort); up the Madon to Mirecourt; and through the Haye south-west to Neufchâteau (for Chaumont and Langres) and west to Toul for Paris.

From Strasburg two main roads lead up the left bank of the Rhine and two down; one runs up the Breusch valley for the St. Dié basin; two cross the Kochersberg to Wasselonne and Zabern; and there are at least three important roads on the right bank of the Rhine, leading respectively to Freiburg, to Karlsruhe, and up the Kinzig valley.

Minor road-centres, but still too important to be passed over, are Colmar, Belfort, Neufchâteau, and Toul.

Colmar, beside its direct roads to Bâle, Belfort, and Strasburg, commands two Vosges passes (Schlucht and Bonhomme) and a very important Rhine-crossing (Neu Breisach); it thus has six important roads radiating from it.

Belfort lies on the junction of the Paris–Bâle road and the Rhine–Doubs road mentioned above; it therefore has first-rate roads to Lure (for Langres and Paris), Bâle, Strasburg, and Besançon. In addition it lies at the foot of the Bâlon d'Alsace

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road for Épinal and Nancy, and this line is prolonged by a sixth main road running south into Switzerland.

Neufchâteau has a remarkable number of first-class roads. They run up the Meuse to Langres; over the level Oxfordian outcrop to Chaumont; over the Barrois plateau and down the Ornain to Bar-le-Duc; down the Meuse to Verdun; across the Soulossois to Nancy; through the Xaintois to Mirecourt and Charmes; and across the Vôge to Darney, Bains, Luxeuil, and Belfort.

The importance of Neufchâteau as a strategic centre depends on this network of roads (reinforced by railways; see following section) surrounding it. Verdun, Metz, Château-Salins, St. Dié, Gérardmer, and Belfort are all about equidistant from it and can all be reached by good and direct roads. The road joining Neufchâteau and Strasburg, by Charmes, Rambervillers, Raon-l'Étape, and Schirmeck, was successfully held at Charmes against the German advance of 1914.

Toul lies on the Paris–Strasburg main road, and has other roads radiating north to the Woëvre, north-east to Frouard for Metz, south-east to Vezelise and the Xaintois, and south-west to Vaucouleurs.

Railways

The Imperial Railway System

Alsace was remarkable for the early development of its railway system. Nicolas Koechlin, one of the leading manufacturers of Mulhouse, determined in the thirties to supply Upper Alsace with railway transport. He formed successively the Mulhouse–Thann Railway Company, which opened its line in 1839, and the Bâle–Strasburg Company, whose line was opened in 1841. The capital of these two companies together amounted to about 49,000,000 francs. The lines were designed primarily for local traffic, but each—especially the Bâle–Strasburg railway—was intended to play a part in future international development.

This international development took place in the next twenty years. The construction of the Paris–Strasburg and Paris–Mulhouse lines brought Alsace-Lorraine into direct communication with the capital and with the sea at Havre. At the same time the Alsace-Lorraine system was linked up with those of the neighbouring countries. From Metz, which early and

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inevitably became a railway centre, lines were built connecting with Luxemburg by way of Thionville and with Prussia by way of Forbach; from Strasburg new lines ran through Weissenburg to the Palatinate and through Kehl to Baden. At its other extremity the Strasburg–Bâle line was prolonged into Switzerland.

The main lines of railway communication were thus laid down ten years before the annexation. In 1854 the French Eastern Railway Company (*Compagnie des chemins de fer de l'Est*) was constituted, and the whole of the railways of Alsace-Lorraine came gradually under its control.

During the sixties the development of the railway system took the form of an increase in the number of branch lines connecting remote districts with the main lines already laid down. Among others lines were built from Strasburg to Molsheim with branches north to Wasselonne and south to Barr; from Schlettstadt to Markirch; from Bollweiler to Gebweiler; from Cernay to Sentheim; from Hagenau to Niederbronn, and thence by Bitche to Saargemünd; and from Avricourt to Dieuze. These were designed as single lines, adapted for comparatively light and slow traffic, and were thus very much cheaper in cost per mile than the main lines; they were also financed on a new system, due to the initiative of Migneret, prefect of Bas-Rhin, according to which the State, the department, and the communes co-operated to find capital for the undertaking. Migneret's innovation consisted in a combined interpretation of the Local Roads Law of 1836 and the Railway Law of 1842, which enabled the whole preparation of the permanent way short of the actual laying down of rails to be interpreted as the construction of a local road, to be jointly financed as such by the department, the communes, and the parties interested; leaving only the rails, buildings, and rolling-stock to be supplied by a railway company, the company again being assisted by the State, the department, and the communes. This idea, combined with the reduced cost of building these local lines, greatly stimulated the general extension of the railway system.

By 1870 the future Reichsland contained the following railways:

Bâle–Strasburg–Weissenburg.

Mulhouse–Altmünsterol (for Belfort).

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Lutterbach–Wesserling.
Cernay–Sentheim.
Bollweiler–Gebweiler.
Schlettstadt–Markirch.
Strasburg–Mutzig; with branches Molsheim–Barr and Molsheim–Wasselonne.
Strasburg–Kehl (for Baden).
Vendenheim–Avricourt (for Paris).
Avricourt–Dieuze.
Hagenau–Saargemünd.
Novéant–Metz–Styring (for Saarbrücken).
Metz–Thionville (for Luxemburg).
Thionville–Fontoy (for Montmédy).
Saargemünd–frontier.

All these (a total length of 460 miles) belonged to the *Compagnie de l'Est*. There was only one line in other hands, namely that joining Münster to Colmar, which had been built and was still owned by the town of Münster.

It may be remarked that the Alsace-Lorraine lines were, as might be expected, the most prosperous of all sections of the Est railway. The gross revenue per kilometre was highest on the Paris–Strasburg line (45,000 fr. in 1853, rising to 79,000 fr. in 1869). On the Bâle–Strasburg line it rose from 13,800 fr. in 1842 to 42,500 fr. in 1869; between Strasburg and Weissenburg from 6,000 fr. in 1855 to 22,000 in 1869; between Metz and Forbach from 22,000 fr. in 1853 to 61,000 in 1869; between Metz and the Luxemburg frontier from 14,000 fr. in 1855 to 40,000 in 1869. On the branch lines the gross revenue in 1869 varied between 8,000 and 12,000 fr. according to the line. The Est railway as a whole was in 1862 making a gross income of 39,000 fr. per kilometre, while the figures for the railways of Alsace-Lorraine alone stood at 40,000.

The Treaty of Frankfort imposed upon the French State the repurchase of all concessions granted to the Est company in annexed territory—the State having originally reserved the right of such a repurchase—whereupon the whole railway system of annexed Alsace-Lorraine would pass automatically to the German Empire. The only exception was the Münster–Colmar line, which was separately bought up by the German Empire at a cost of 2,700,000 fr. The sum which the French Government paid to the *Compagnie de l'Est* was 325,000,000 fr.;

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this was allowed to be deducted from the war indemnity. Rolling-stock was supplied from Germany, since most of the rolling-stock of the Est company had been removed to the interior of France before the German occupation actually took place. The whole of the Alsace-Lorraine railways thus became part of the German imperial railway system.

At the same time the German Government undertook the working of the Guillaume-Luxembourg system, consisting of lines running from Luxemburg to the Lorraine frontier, to the Belgian frontier at Bettingen and Ulflingen, and to Wasserbillig; from Bettemburg to Rumelange by Ottange and to Esch-sur-Alzette; and from Ettelbrück to Diekirch—in all 108 miles of line. The working of this system had formerly been leased to the *Compagnie de l'Est*; it was now transferred to the German State Railways in consideration of a yearly rent of 2,500,000 fr. The length of line has been subsequently increased to 121 miles.

The German annexation initiated a third period of railway construction. Hitherto the chief connexions had been with France, and a traveller going from northern Lorraine to southern Alsace would naturally go through Nancy. It was necessary therefore first to connect the Reichsland system more closely with that of Germany, and secondly to improve the communications parallel to the new frontier and on the German side of it. Certain railways crossing the frontier, such as that joining Metz to Verdun, which had been begun before the war, were completed; others, like that joining Thann to Remiremont, which had only been projected, were abandoned.

The most important undertakings were as follows. A direct double line was completed from Metz to Strasburg, by building the section Rieding–Rémilly; the Wasselonne–Barr line was extended at its two ends to Zabern and Schlettstadt, to give a direct route between Upper Alsace and Lorraine; new lines from Thionville to Sierck and from Strasburg to Lauterburg connected Lorraine and Alsace respectively with northern Germany, and three lines running east from Colmar (through Neu Breisach), Mulhouse, and Hüningen connected Upper Alsace with southern Germany.

These were the first lines to be built; on their completion a number of local lines were undertaken. Some of these gave improved access to the iron-mines of Lorraine; others opened

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up the Vosges valleys; others were primarily of strategic interest, such as that connecting Château-Salins with Metz.

The expense of these German-built lines fell mostly on the Empire. In a very few cases the Reichsland defrayed the whole expense; in the majority it contributed between a quarter and a half; while in some cases the Empire defrayed the whole cost. A few small lines were built by private capital; thus the Hayange–Algrange line was constructed by local ironmasters, the Strasburg–Schiltigheim by Schiltigheim manufacturers, the Lützelburg–Pfalzburg by a Pfalzburg company, &c.

The following is a complete list of the Reichsland railway lines (other than tram-lines), normal gauge and single track, except where otherwise specified, and with the year of opening given in every case. The list is correct to 1910.

(1) Strasburg to the Swiss frontier, for Bâle; 1840–4. 85 miles, all double track.

(2) St. Louis to the centre of the Rhine bridge at Hüningen; 1878. 2¼ miles.

(3) Mulhouse to the centre of the Eichwald Rhine bridge, for Mühlheim; 1878. 11 miles.

(4) Lütterbach to Mulhouse-Nord and Rixheim; with branches in Mulhouse to the canal port, &c.; 1885–99. 9 miles.

(5) Mulhouse to the frontier at Altmünsterol, for Belfort; 1857, 1858. 22 miles of double track.

(6) Altkirch to Ferrette; 1892. 15 miles.

(7) Lütterbach to Cernay, Thann, and Thur valley to Krüt; 1839, 1863, and 1905. 20 miles.

(8) Cernay to Sentheim, Massevaux, and Doller valley to Sewen; 1869, 1884, and 1901. 17 miles.

(9) Bollweiler to Lautenbach; 1870, 1884. 8 miles.

(10) Colmar to the centre of the Rhine bridge between Alt and Neu Breisach; 1878. 13 miles.

(11) Colmar to Ensisheim and Bollweiler; 1901. Narrow gauge; 22 miles.

(12) Colmar to Markolsheim; 1885, 1890 Narrow gauge; 13 miles.

(13) Colmar to Münster and Metzeral; 1868, 1893. 15 miles.

(14) Schlettstadt to Markirch; 1864. 13 miles.

(15) Weilertal junction on No. 14 to Weiler; 1891. 6 miles.

(16) Schlettstadt to Barr, Molsheim, Wasselonne and Zabern; 1864, 1877. 40 miles.

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(17) Strasburg to Molsheim, Schirmeck, Rothau, and Saales; 1864, 1870, 1890. 38 miles.

(18) Strasburg to Königshofen; 1883. 2 miles.

(19) Strasburg to the centre of the Kehl Rhine bridge; 1861. 5 miles, double track.

(20) Strasburg to the Bavarian frontier at Lauterburg; 1876. 35 miles, double track.

(21) Schiltigheim branch of the above; 1885. Half a mile.

(22) Lauterburg to the adjacent port on the Rhine; 1884. 1 mile.

(23) Vendenheim (between Strasburg and Brumath) to the Bavarian frontier at Weissenburg; 1855. 37 miles, double track.

(24) Weissenburg to Lauterburg; 1900. 13 miles.

(25) Walburg (north of Hagenau) up the Moder valley to Lembach; 1891, 1899. 11 miles.

(26) Selz to Walburg and Merzweiler (north-west of Hagenau); 1893. 21 miles.

(27) Hagenau to the centre of the Rhine bridge at Roppenheim, for Rastatt and Karlsruhe; 1895. 18 miles, double track.

(28) Bischweiler to Oberhofen (a connecting line joining No. 23 to No. 27 without passing through Hagenau); 1900. 2 miles.

(29) Schweighausen to Bitche and Saargemünd; 1864, 1869. 50 miles.

(30) Steinburg to Obermodern and Hagenau, connecting Hagenau with Buchsweiler and Zabern; 1864, 1877, 1881. 30 miles, of which over 11 are double track.

(31) Buchsweiler to Ingweiler; 1889. 4 miles.

(32) Mommenheim (near Brumath) to Ingweiler and Saargemünd; 1895. 46 miles, double track.

(33) Saargemünd to the Prussian frontier; 1870. Two-thirds of a mile, double track.

(34) Kalhausen (where No. 32 reaches the Saar) to Saaralben; 1895. 5 miles, double track.

(35) Wingen to Münztal-St. Louis; 1897. 7 miles.

(36) Strasburg to Avricourt on the frontier (main Paris–Strasburg line); 1851–2. 57 miles, of which 51 are double.

(37) Lützelburg to Drulingen, with branch to Pfalzburg; 1883, 1903. Narrow gauge, 13 miles.

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(38) Saarburg to Alberschweiler ; 1892. 10 miles.

(39) Oberhammer, on No. 38, to Vallérystal ; 1892. 6 miles.

(40) Rieding (a mile out of Saarburg) to Rémilly (completing the direct line Zabern–Metz) ; 1877. 40 miles, double track.

(41) Saarburg to Saaraltdorf junction (loop line joining No. 36 and No. 40) ; 1872. 2 miles.

(42) Berthelmingen (at the point where No. 40 leaves the Saar valley) down the Saar to Saargemünd ; 1872. 26 miles, double track.

(43) Saaralben to the frontier at Chambrey (on the Seille), for Nancy ; 1873, 1881. 36 miles, 16 of double track.

(44) Burthecourt (on No. 43) to Vic ; 1873. 2 miles.

(45) Avricourt to Bensdorf ; 1864, 1882. 21 miles.

(46) Saargemünd to Beningen and Hargarten, passing through St. Avold ; 1865, 1866, 1882. 26 miles, double track.

(47) Rémilly to the Prussian frontier at Styring ; 1851, 1852. 32 miles, double track.

(48) Courcelles (near Metz) to Teterchen (close to Hargarten on No. 46) ; 1873–6. 19 miles, double track.

(49) Rémilly to Metz and thence to Thionville and the Luxemburg frontier at Gr. Hettange ; 1851, 1854, 1859, 1908. 50 miles, 42 of double track.

(50) Metz to Château-Salins, by Delme ; 1903. 36 miles.

(51) Metz up the Moselle to Novéant (frontier) ; 1850, 1908. 10 miles, double line.

(52) Metz to the frontier at Amanvillers, for Verdun ; 1873, 1908. 11 miles.

(53) Hagondange to Grande Moyeuvre ; 1888. 6 miles, 3 of double track.

(54) Thionville to the frontier at Fontoy, for Montmédy ; 1863. 11 miles, 10 of double track.

(55) Hayange to Algrange ; 1892. Nearly 3 miles, double track.

(56) Fontoy–Audun-le-Tiche ; 1899, 1901. 13 miles.

(57) Thionville to Völklingen ; 1880–3. 43 miles, 40 of double track.

(58) Bouzonville to Dillingen on the Saar ; 1901. 20 miles, double track.

(59) Wadgassen to Bous ; 1880. 1 mile, double track.

(60) Thionville to the Prussian frontier at Sierck ; 1878. 14 miles, double track.

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(61) Metz to Anzelingen, where No. 57 enters the Nied valley ; 1909. 19 miles, double track.

(62) Schlettstadt to Sundhausen ; 1909. 9 miles.

Together with some 15 miles of loops and connexions, of which 13 are double track, these railways make a total of 1,181 miles, of which 48½ miles are narrow gauge, while of the rest 645½ miles are double track, and the balance (487 miles) single track, normal gauge.

The total mileage multiplied by about 2½ during the German domination, the most rapid rise being during the first decade, when the mileage increased by over 60 per cent.

The capital sunk by the Empire in permanent ways and buildings, including the original purchase of the Est railways (deducted from the indemnity and therefore considered for this purpose as paid by the imperial treasury), the purchase of other lines, and subsequent constructions, was estimated in 1910 at 802,000,000 marks (roughly £40,000,000) ; but this sum was estimated to exceed the true capital value by 94,000,000 marks, owing to the fact that the aggregate purchase prices exceeded the original aggregate cost of construction by this sum. Deducting this sum therefore, and adding the capital supplied by the Reichsland, communes, private persons, &c., a total capital value of 757,000,000 marks is reached. About 93 per cent. of the total capital in 1910 was therefore owned by the Empire, which had also sunk some 20,000,000 marks in the Guillaume-Luxembourg railways.

The employés of the whole State railway system in the Reichsland number between 31,000 and 32,000, of whom half are working men ; the total wages and salaries bill comes to about 52,000,000 marks annually, or an average remuneration of £87 per annum for the entire staff, and £55 10*s.* for the average working man, or 21*s.* 4*d.* per week.

Since the replenishment of the system with rolling-stock was completed (about 1874) the quantity of rolling-stock has multiplied by about 2½, thus keeping pace with the increased mileage. The number of locomotives rose from 443 in 1875 to 1,109 in 1909 ; that of passenger coaches from 776 to 1,970 ; that of goods wagons from 10,982 to 23,405. The average distance travelled in the year by any given unit of rolling-stock all also increased ; so that the total mileage travelled by all locomotives rose from 4·7 million miles to 18·6 ; the

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axle-mileage of passenger coaches from 29·8 million to 180 million, and that of goods wagons from 155 million to 450 million (in 1908; figures for 1909 wanting). Thus the distance travelled by each locomotive in the year rose by about 60 per cent.; that travelled by each passenger-coach axle by 100 per cent.; and that by each goods-wagon axle by about 10 per cent. These figures include journeys by Reichsland rolling-stock on lines outside, as well as inside, the country.

The administration of the railway system was in the hands of the *Kaiserliche General-Direktion der Eisenbahnen in Elsass-Lothringen*, founded in 1871. This was, in all matters pertaining to railway organization, construction, and transport, a practically autonomous and independent body, only dependent upon the *Reichsamt f. d. Verwaltung der Reichseisenbahnen* in certain specified emergencies for certain financial powers, and for the appointment of certain high officials. The *General-Direktion* was a collegiate body, composed of a President, three heads of departments for Traffic, Administration, and Construction, and legal and technical experts. It stood in direct relations with the *Centralbureau*, consisting of a number of departments concerned with various aspects of railway organization.

It is remarkable that of the entire railway staff, officials and wage-earners together, less than half were of native origin, and more than a quarter were Prussians.

Private Railways and Tramways

The following railways and tramways are privately owned:

(1) The Rappoltsweiler road-railway connects Rappoltsweiler with the main line by means of a normal-gauge line, 2½ miles long, laid on the high road. There are 2 locomotives and 3 passenger coaches, and about 14 officials and employés. The gross takings amount to about £4,000 per annum. Opened 1894.

(2) The Rosheim–St. Nabor railway is a normal-gauge line opened in 1902, and seven miles long. The company owns 3 locomotives, 4 passenger coaches, and 23 goods wagons; most of the traffic is in goods, and the gross takings amount to over £8,000.

(3) The Thionville–Mondorf railway is a narrow-gauge line, about 19 miles long, opened in 1903. It possesses 6 locomotives,

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10 passenger coaches, and 24 wagons; and the gross takings, which come to nearly £5,000 annually, have proved lately insufficient to cover the running expenses.

(4) The Erstein–Oberehnheim–Ottrott narrow-gauge railway is nearly 12 miles long and was opened in 1907. It has 2 locomotives, 5 passenger coaches, and 16 wagons, and its gross takings of about £1,800 gives a very small margin of profit.

(5) The Kaysersberg narrow-gauge railway is 15½ miles long, and runs from Colmar to La Poutroye, with a branch from Colmar to Winzenheim. It was opened in 1885. It has 8 locomotives, 24 coaches, and 77 wagons, and its annual gross takings are about £14,000. It has a practical monopoly of all traffic for the Weisstal, and is the most important of these smaller railways. If a direct railway should ever be built from Colmar to St. Dié, it would follow this line and cross the Col du Bonhomme.

(6) The Mulhouse–Ensisheim–Wittenheim road-railways (narrow-gauge) were opened in 1885 and 1889. The total length of line is nearly 18 miles; there are 4 locomotives, 25 coaches, and 35 wagons. The takings are about £12,000 annually.

(7) The Strasburg road-railways (narrow-gauge) were opened at various dates between 1886 and 1903. They include 61 miles of line, radiating in various directions into the country round Strasburg. The company also owns lines on the right bank of the Rhine, but these are omitted from the present figures. There are 15 locomotives, 47 coaches, and over 200 wagons; a large amount of traffic, both in passengers and in goods, is carried, and the total gross takings on the various lines involved are over £28,000.

(8) The Strasburg tramway company owns nearly 58 miles of line in Strasburg (to be distinguished from the local road-railways No. 7 above), with electric traction. With a yearly gross income of about £140,000, the company pays well.

(9) The Metz electric trams are municipally worked, together with their generating station, which supplies the town with electricity. There are about 16 miles of line, and the takings do not quite balance the expenses.

(10) The Mulhouse tramway company runs railless electric cars with overhead wires on a length of 2 miles.

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(11) The Colmar municipal tramway has a line under 2 miles in length.

(12) The Trois-Épis (Drei Aehren) tramway connects that place—a well-known mountain health resort—with Türkheim, and is nearly 5 miles long.

(13) The Schlucht electric tramway company's line, about 6½ miles long, connects Münster with the Schlucht Pass.

Railways in French Lorraine

In consequence of the carrying-out of the French railway scheme of 1879, this region is remarkably well served with railways in proportion to its population. Apart from such lines of traffic as Paris–Nancy–Avricourt and Paris–Belfort, most of the main lines have a primarily strategic interest; this is especially true of the six double-track lines which radiate from Neufchâteau, whose station is the pivotal point of the whole Lorraine strategic railway system. The Moselle and Meurthe valley lines are of especial importance, as connecting the Vosges industrial areas with their French markets; and the only district which is badly provided with railways is the north-west, where the Briey plateau and Meuse valley are in this respect far behind the rest of Lorraine. The political causes of this fact are obvious. A section is appended below on the special problem of communications as affecting the Briey plateau.

Water Communications

Waterways

Alsace-Lorraine is partly traversed, partly skirted, by four great waterways. The Rhine bounds it on the east; the Rhône–Rhine canal crosses its south-eastern corner; the Marne–Rhine canal bisects the entire district in an east-and-west line; and finally the Canal de l'Est runs from north to south the whole length of the Lorraine plateau.

In addition to these main waterways, each of them important, in its way, for the general water transport system of France or Germany or both, there are several smaller canals, some mere branches of the foregoing, while others are important enough to be regarded as separate units. Such are the Moselle and Saar canals in the north, the Breusch canal starting at Strasburg and the Hüningen canal starting near Mulhouse.

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We shall briefly review these waterways in turn:

1. *The Rhine.*—The Rhine is a first-class navigable river only as far up as Mannheim and Ludwigshafen, together forming a vast terminal port, from which river-borne goods are distributed over all south-western Germany and the neighbouring countries. From Mannheim to Strasburg the river is still navigable, but the gradient is noticeably greater and the available depth of water less. Above Strasburg these disadvantages are so far accentuated that the Rhine between Strasburg and Bâle can only in a very restricted sense be considered a navigable river at all.[1] Thus from Hüningen to the mouth of the Ill (Freistett, below Strasburg) are about 89 miles of waterway in which the channel is under 3 ft. deep at low water, and only about 4 ft. 6 in. at mean water; for another 20 miles, as far as Plittersdorf (opposite Rastatt), the low water depth is 4 ft., the mean water depth 6 ft. 6 in.; hence to Lauterburg the low-water depth is 4 ft. 6 in., the mean-water depth 7 ft. 6 in.

Now the general conditions of navigation demand an assured minimum depth of at least 4 ft. 6 in.; water shallower than this cannot be used by the ordinary barges with safety, and transport on waterways under this minimum depth does not in general pay. There are, however, on the average 125 days in the year when the depths on the whole upper Rhine—above Germersheim, that is to say—are under 4 ft. 6 in.; for one-third of the year therefore the entire Alsatian Rhine is closed to large barges. The resulting difficulties are increased by the fact that, since the correction of the Rhine, gravel banks have formed almost everywhere, which shift with great rapidity, sometimes nearly a mile in the course of a single year. The movements of these banks take place according to laws which have not as yet been discovered, so that they cannot be predicted; and the motion of the gravel is so rapid, especially at high water when traffic is otherwise easiest, that buoys cannot be moved fast enough to keep pace with the fluctuations of the channel. To these obstacles must be added the fact that the gradient of the river-bed, especially above Strasburg,

[1] It was in 1904 that a steamer first made the passage from Strasburg to Bâle. It took three days, anchoring at night. Since then a fairly regular summer service has been instituted, figures for which are given below ('Water-borne traffic across the frontiers', (*a*). p. 395).

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is decidedly steep, and the current in consequence much more rapid than on the middle Rhine.

Some at least of these difficulties might perhaps be overcome by a new correction of the river, which should force the stream to scour its own bed and deposit the gravel on the banks. Proposals in this direction have been made ; but in quite recent years the Germans decided to abandon the project of improving the Rhine between Strasburg and Bâle, substituting a canal and using the river for the generation of electrical power. This scheme was strongly opposed by the Swiss, who had everything to lose and nothing to gain by the destruction of an international river which does, in point of fact, bear a certain amount of traffic as far up as Bâle, even though this traffic has to wait for the right season of the year in order to obtain a sufficient depth of water for the light steamers in which it is carried.

The artificial bed of the Rhine is 200 metres wide from Bâle to the Leopold canal (latitude of Schlettstadt) ; 250 metres thence to Ichenheim (latitude of Erstein) ; 250 metres thence to Lauterburg. The gradient is 5 to 6 ft. per mile above the Kaiserstuhl, 3 ft. per mile near Kehl, 2 ft. per mile near Lauterburg. The profile is now, thanks to the correction of the bed, fairly regular ; but slight rapids occur at Kehl, Neuenburg, Weisweil, and Grauelsbaum. The channel winds irregularly about this bed among the gravel and sand-banks mentioned above.

The régime of the river is extremely regular. In this part of its course the Rhine is almost exclusively fed by snow and glacier-water ; the winter precipitations in its upper basin cause no rise, since they take the form of snow which does not melt till the spring. The result is that the Rhine attains its lowest at the end of the winter, and then rises with great rapidity as the weather becomes warm. The rise lasts from the middle of March to the middle of June, when a maximum is reached. A high level is maintained till the end of August, when a fall begins which is fairly rapid till the end of October, and then proceeds at a slower rate till the beginning of March, when the cycle recommences. The cycle is very seldom interrupted by floods, and the annual curves of maximum, minimum, and mean water-levels are remarkably parallel. The highest level reached in a wet winter never equals the lowest June high waters.

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The standard gauge for the whole of this section is at Kehl. According to Kehl readings the average June high water stands at about 3·8 metres, with exceptional readings as high as 4·4 or as low as 3·4. The February low water reads on average 2·5 metres, occasionally as high as 3·2 or as low as 2·2. From these figures it will be seen how small is the deviation from the average annual curve.

2. *The Ill.*—The Ill is navigable from its mouth below Strasburg to Ladhof, the port of Colmar. Formerly used as a waterway when the Rhine, as yet uncorrected, was no more than a maze of unnavigable channels, it has now been completely superseded by the Rhône–Rhine canal.

3. The *Rhône–Rhine canal* was projected in 1744 and built, with interruptions, between 1783 and 1834. Leaving the Doubs at the mouth of the Allaine river, it ascends the valley of that river, past Montbéliard, to the frontier, which lies just beyond the eleventh lock. A branch (*Haute-Saône canal*) strikes northward up the Savoureuse to Belfort, destined ultimately to connect with the upper Saône and the Moselle. Two more locks lead to the summit level (347 metres), 1·8 mile long, from which a series of 16 locks leads down to the Larg valley. The canal crosses the Larg at Dannemarie and descends to the Ill, which it strikes at Illfurt. At Mulhouse it leaves the Ill and cuts directly across the plain to Strasburg. At Napoleon's Island enters the *Hüningen canal*, 17½ miles long, leading to Hüningen; at Kunheim enters the *Breisach canal*, connecting with the Rhine, and 1·9 mile later the *Colmar canal*, 8 miles long.

Above Mulhouse the canal is fed chiefly by the Larg; west of the summit, by the streams of the Doubs basin. Below Mulhouse it is supplied with water from the Rhine by means of the Hüningen and Breisach canals.

The dimensions of the canal are as follows. Strasburg to Mulhouse (62 miles): 52½ ft. broad at the surface, 33 ft. at bottom; depth 6½ ft. Beyond Mulhouse: 49 ft. at the surface, 33 at bottom; depth 5¼ ft. It is urgently required, in order to accommodate the future heavy canal traffic between Alsace and the rest of France, that this section be improved, at least by deepening to 6½ ft. There are at present passages where 100-ton barges cannot get past.

The Hüningen canal for the first two-thirds of its length is

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52½ ft. broad at the surface, 33 at the bottom, and 5¼ ft. deep. The remaining third varies from 49 to 58 ft. at the surface, 18 to 26 at the bottom, and 5¼ to 13 ft. deep. It was built in the years 1824–34 chiefly to supply water to the Rhône–Rhine canal.

The Colmar canal is 52½ ft. broad at the surface, 33 ft. at the bottom, and 6½ ft. deep. It was built in 1860–4; it crosses the Ill and debouches into the canalized Larg.

The Breisach canal (38 ft. broad at surface, 23 ft. at bottom, 5¼ ft. deep) was built in 1867–77 to supplement the water-supply for the Rhône–Rhine canal derived from the Hüningen canal, but was also designed to serve for navigation if required.

4. The *Breusch canal* is 12 miles long; it connects Strasburg with Avolsheim (Molsheim–Wasselonne railway). Its dimensions are: breadth 39 ft. at the surface, 26 ft. at bottom; depth 4 ft. 3 in.

5. The *Marne–Rhine canal* was built between 1838 and 1853. Ascending the Ornain valley from Bar-le-Duc, it leaves it at Demange-aux-Eaux to pass beneath the Portland escarpment in a tunnel, from which it emerges into the valley of the Vidus river, which it descends to meet the Meuse at Void. Immediately afterwards, at Troussey, it joins the Canal de l'Est, and proceeds through the Val de l'Ane (tunnel) to Toul.

Toul is the western extremity of a ring of waterways which encircle the forest of La Haye and send off branches east, west, north, and south. The Marne–Rhine canal passes along the southern limb of the ring, through Pont. St. Vincent, then north-east to Laneuveville, and so up the Meurthe to Dombasle and up the Lanon to the frontier. The rise is gentle, and the summit-level is long (over 18 miles in length) and passes through the centre of the Lorraine lake district. The western slope of the canal is fed by the lake of Rixingen. In the middle of the lake of Gondrexange the Saar canal branches off northwards. The canal, proceeding, crosses the Saar on an aqueduct, and then enters a tunnel, from which it emerges in the Zorn valley. It descends this valley in 16 locks, and then proceeds by way of Zabern and Brumath to Strasburg. The total fall from the summit-level to the Rhine is 131 metres, in 49 locks.

The dimensions of the Marne–Rhine and Saar canals are: breadth at surface 52½ ft., at bottom 33 ft.; depth 6½ ft.

6. The *Moselle canal* and canalized Moselle leaves the 'ring'

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of waterways, mentioned above, at Frouard and extends to Metz. Its dimensions are : breadth at surface 59 ft., at bottom 39½ ft. ; depth 6½ ft.

7. The *Canal de l'Est* is an important waterway connecting the Meuse, Moselle, and Saône basins. Running up the Meuse valleys it receives the Marne–Rhine canal at Troussey, proceeds through the Val de l'Ane to Toul, thence to Pont St. Vincent and up the Meuse almost to Épinal, whence it crosses the watershed to south-west and descends steeply into the Coney valley, by which it reaches the Saône at Jussey.

8. The projected *Canal du Nord-Est* was intended to unite the Briey plateau with the Valenciennes and Lens coalfields. It would run in the Chiers valley, beginning at Longwy and crossing the Meuse near Sedan.

The function of this canal would be to bring *minette* to the Nord and (through Dunkirk) to England, and to bring coke to Lorraine. It appears, however, that the mining and metallurgical interests are unfavourable to the project, maintaining that it would be too costly as compared with rail freights.

It may here be remarked that, in view of the desirability of maintaining the connexion between Lorraine and Westphalia, many writers lay stress on the urgency of improvements on the Moselle and the Saar.

Traffic on the Reichsland Waterways

The following figures give the traffic at the chief ports and the frontiers for the year 1912. In most cases these figures are rising steadily, owing to the development of navigation, especially on the upper Rhine, in recent years. Thus the number of vessels passing Hüningen on the Rhine rose from 275 in 1911 to 381 in 1912 ; the total number of vessels, entered and cleared together, at Strasburg, from 14,734 to 20,095—a rise of 36 per cent. in a single year. That this year's rise was not exceptional is shown by the fact that the corresponding figure in 1910 was 6,583. In point of fact Strasburg, in the years immediately preceding the war, was rapidly becoming a centre of water-borne traffic hardly less important than Mannheim. Goods were shipped hither direct from the lower Rhine, and distributed either by rail or canal to all parts of the Reichsland. For fuel and cereals especially, the whole region was coming to depend on the entrepôt trade of Strasburg.

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With the advance of Strasburg, however, Lauterburg—never a very important port—is decaying.

In canal traffic the chief ports are Mulhouse, Colmar, and Hüningen. In every case the water-borne traffic is increasing steadily, and in every case it depends immediately on that of Strasburg. At Hüningen the vessels entered and cleared rose from 427 in 1911 to 580 in 1912; at Mulhouse from 2,984 to 3,260; at Colmar from 609 to 675. On the frontiers there is also a rise: at Altmünsterol from 551 to 725; at Lagarde from 3,909 to 5,300; at Novéant alone there is a retrocession from 768 to 764.

The extreme dimensions of vessels for canal traffic are: length 100–130 ft., beam 13 ft. 6 in. to 19 ft., draught 3 ft. 6 in. to 5 ft. 10 in., according to the dimensions of the canal; for traffic on the Rhine, length 287 ft., beam 38 ft., draught 7 ft. 3 in. These large barges, however, can visit Strasburg in summer only.

Strasburg (Rhine Port).—The vast majority of the goods handled at Strasburg port are imports coming up-stream. These amount to over 1,500,000 tons, or over 90 per cent. of the total trade of the port. Among the chief items in the long list of imports are coal, coke, and briquettes (866,000 metric tons), lignite briquettes (47,000 tons), pig-iron (8,802 tons), iron and steel goods (9,179 tons), cotton (1,062 tons), grain (425,000 tons), oil-seeds (3,041 tons), timber (19,000 tons), flour (28,000 tons), oils and fats (7,264 tons), petroleum (23,000 tons), starch (7,164 tons), and sugar (10,129 tons).

The exports up-stream, i.e. to ports above Strasburg (notably Bâle), amount to less than 1 per cent. of the total trade, or about 12,400 tons altogether; this figure is, however, rising rapidly. More than half the total consists of coal (7,732 tons); among other goods may be mentioned lead (619 tons), pig-iron (1,424 tons), iron and steel goods (632 tons), timber (314 tons), oils and fats (311 tons), petroleum (147 tons), and tobacco (194 tons).

The exports going down-stream are more important, and amount to something like 8 per cent. of the total trade. They consist largely of products from the Alsatian potash-mines (potash salts for manure, 26,000 tons; soda, 19,000 tons); timber (18,000 tons); and iron and steel goods (14,000 tons, mostly scrap). There are no imports from up-stream at all, except a few hundred tons of gravel and sand.

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The number of vessels passing in or out during the year is 7,747,[1] of which 91 per cent. are German, 6 per cent. Dutch, and 3 per cent. Belgian. The traffic mostly consists of towed barges with their tugs; there is no passenger traffic, and only about 300 cargo steamers (again reckoning each call twice over). Traffic is densest during the high-water season (summer), but continues all the year round; above Strasburg, however, traffic is entirely interrupted for some 4 or 5 months of the year.

The goods coming up the Rhine and transferred to rail at Strasburg amount to some 229,000 tons. Of these fuel and cereals are the most important items. Coal, coke, and briquettes together account for 58,929 tons; lignite 9,741 tons; grain and flour over 143,000 tons. Thus Strasburg is a great railway distributing centre for goods of this kind, which are brought up the Rhine by water.

Goods transferred from rail to barge at Strasburg amount to under 70,000 tons, and this is nearly half potash salts from the Alsace field, the rest being chiefly timber (14,000 tons), tar and pitch (9,800 tons), scrap iron, and iron-ore.

The rapid growth of Strasburg into a great river-port may be—and has often been—cited as an example of the advantages accruing to Alsace from German rule. This is partly just, for it is true that Alsace has everything to gain by the improvement and the free use of the waterway. But it should not be forgotten, if arguments of this kind are to be used, that the development of Strasburg in this direction is of very recent date; and that for more than thirty years Strasburg continued to petition the Empire for improvements in the river such as would permit her growth into a port, while in the meantime she actually dug harbours at her own expense, awaiting the time when they could be used. These struggles were, however, frustrated by the jealousy of Bavaria and Baden till early in the present century.[2]

Strasburg (*Canal Port*).—(*a*) The Rhône–Rhine canal brings practically nothing into Strasburg except sand and gravel (68,000 tons). Beside this the only items worth mentioning are bricks and tiles (5,800 tons), tar and pitch (4,900 tons),

[1] Reckoning each call twice, with the exception of a few river boats transferred at Strasburg to the canals, and *vice versa*.

[2] Documented account in Léon: 'Le port de Strasbourg', *Annales de Géographie*, xii (1903), pp. 67–72.

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grain (3,700 tons), and metal goods (3,300 tons). No other item amounts to more than one or two hundred tons.

On the other hand this canal exports over a quarter of a million tons of goods from Strasburg (276,481 tons). Of this 225,000 tons consist of coal, briquettes, and coke ; 11,000 tons of grain ; 18,000 of petroleum ; 13,000 of flour ; 1,500 of sugar ; and 1,300 of starch. The other items are all below 1,000 tons.

(*b*) On the Marne–Rhine canal the imports to Strasburg are larger than the exports. The imports amount to 187,223 tons ; of this about 80,000 tons are coal, briquettes, and coke ; 28,000 tons are building-stone ; 20,000, soda ; 11,000, graphite, ochre, &c. ; 5,000, timber. Practically no grain comes in this way ; and of metal goods only the heaviest, in proportion to their value, such as rails, reach Strasburg by the Marne and Rhine canal.

Exports along this line amount to 153,021 tons, of which 125,000 are coal, &c. No other item is important, except 8,000 tons of wheat and 9,000 tons of wheat flour.

The total canal traffic of Strasburg thus amounts to 703,749 tons, of which 274,247 are imports and 429,502 exports ; while 363,505 are carried by the Rhône–Rhine canal, 340,244 by the Marne–Rhine canal.

The total of vessels passing in or out of Strasburg canal port during the year (thus reckoning each call twice) is 12,348. About 1·5 per cent. of these are Belgian ; under 1 per cent. French ; the rest almost exclusively German. Traffic is densest in spring and summer, but is lively all the year round. Practically all the vessels are barges towed from the bank ; a very few barges have their own power.

Small quantities of goods are transferred from canal to rail at Strasburg (14,525 tons in all) : mostly timber (5,000 tons), coal (5,000 tons), and ochre, graphite, &c. (2,000 tons). Nothing is transferred from rail to canal except a little coal.

The above figures do not include water-borne trade in direct transit. Transit trade passing into the Rhône–Rhine canal at Strasburg amounts to 539,042 tons, of which over 400,000 tons represents coal and coke ; 18,000, petroleum ; 24,000, grain and flour ; 53,000, stone, bricks, and tiles. Transit trade passing out of the Rhône–Rhine canal amounts to 75,996 tons, of which the only important item is 44,000 tons of sand and gravel.

Transit trade passing into the Marne–Rhine canal amounts

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to 170,062 tons, including large quantities of coal (124,000), of grain and flour (17,000 tons), and of gravel and sand (8,700 tons). The transit trade passing out amounts to 497,594 tons, and consists chiefly of coal (278,000 tons), stone, bricks, and tiles, cement, soda, and iron and steel.

Lauterburg.—This is a quite insignificant Rhine port. The total trade is only 321,000 tons, and almost all this is coal, coke, and lignite from down-stream (coal 266,000 tons, coke 48,000 tons, lignite 4,700 tons). Small quantities of gravel and sand, and of iron and steel, are also imported from the same direction. The sole exports are about a thousand tons of timber. There is no trade at all with ports higher up the Rhine.

Of the imports to Lauterburg by water, 18 per cent. is transit trade, transhipped to rail at the water's edge. The whole of the exports by water is transit from rail.

The traffic consists almost entirely of tugs with one barge apiece, the average weight of goods taken in or discharged by each barge being 300 tons. Over 90 per cent of the vessels are German, the rest Dutch. The total number of vessels entered and cleared in the year is 2,200; i. e. about 500 barge-loads of goods are brought up-stream to Lauterburg yearly, the barges generally returning empty.

Mulhouse.—The canal port of Mulhouse has a large trade, in which imports from the direction of Strasburg greatly predominate. These imports amount to over 316,000 tons, whereas the imports from the Belfort direction are under 3,500 tons; the exports towards Strasburg again are nearly 30,000 tons, while the exports towards Belfort are only about 14,000. Mulhouse imports primarily coal and grain; these are shipped direct up the Rhine, the barges frequently passing straight through at Strasburg to the Rhône–Rhine canal without breaking bulk. The imports of coal, coke, and briquettes together amount to 273,084 tons; lignite to 508 tons; petroleum to 442 tons. Grain amounts to 4,775 tons; flour to 11,630 tons. Besides these may be mentioned stone, gravel, sand, cement (nearly 15,000 tons).

The exports in the direction of Strasburg consist chiefly of sewage (19,000 tons), metal goods (4,000 tons), and chemicals (2,750 tons). In the direction of Belfort the sole export consists of coal; the imports from this direction consist entirely of stone and a little timber.

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The traffic is carried in barges towed from the bank, of which 3,260 were entered and cleared in 1912. Their average capacity is 270 tons, but one-third travel empty. Traffic as a whole is busiest in the summer, as depending chiefly on the state of the Rhine; but the traffic with the Doubs basin is more evenly distributed, being busiest on the whole in winter. There is a very fair percentage of French and Belgian shipping.

An inconsiderable fraction of the imports to Mulhouse is transferred to rail (7,000 tons); this consists almost entirely of coal.

Colmar.—Of the total water-borne trade 95 per cent. consists of imports from the direction of Strasburg, the rest of exports in that direction. The imports, amounting to 61,075 tons, consist mostly of coal, coke, and briquettes (34,540 tons), grain and flour (7,406 tons), stone, bricks, and tiles (12,274 tons), sugar (2,358), and sewage (2,326). Of the exports nothing is important except timber (1,817 tons), in the shape of soft-wood planks and joists.

The barges entered and cleared at Colmar in the year number 675, with an average capacity of 240 tons; over a third travel empty. Traffic on the whole is busiest in the summer; but the exports, consisting as they do almost entirely of timber, obey the conditions of forestry rather than those of easiest navigation, and take place mostly at the end of the year.

Most of the imports are consumed locally, but about 6,000 tons of coal are transferred to rail for distribution. Practically all the exported timber is brought in by rail.

Hüningen.—This canal port receives by water some 51,000 tons of goods annually, and dispatches about 6,000 tons. It is thus for the most part an importing centre. The only important articles concerned are fuels, including 28,000 tons of coal, 3,000 tons of coke, and 1,400 tons of coal briquettes, as well as 16,700 tons of petroleum. A certain amount (1,000–2,000 tons) of stone is also received.

The exports are confined to 5,660 tons of tar and pitch, and 475 tons of stone.

The total number of barges entered and cleared in the year is 580, with an average capacity of 240 tons; but nearly half of these (i. e. almost all leaving Hüningen for the north) are empty. Traffic depends almost entirely on the Rhine, and is therefore much busier in summer than at other times of the year.

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Water-borne Traffic across the Frontiers.—(*a*) At Hüningen (Rhine, between Germany and Switzerland) the goods crossing the frontier up-stream amount to 47,338 tons; those going down-stream to 23,711. The former consist chiefly of coal (23,000 tons), timber, and metal goods; the latter of chemicals, cement, metal goods, and tar and pitch. The traffic consists almost exclusively of barge-trains with tugs; it is much largest in summer, and—at any rate so far as up-stream work is concerned—ceases entirely in the winter.

(*b*) At Altmünsterol (Rhône–Rhine canal, between Mulhouse and Belfort) the traffic towards France amounts to 54,104 tons, mostly coal, with small quantities of bricks, iron, and steel. The traffic in the other direction is only 6,128 tons and consists almost exclusively of slag. Nearly one-third of the shipping is French, and traffic is on the whole busiest in the spring.

(*c*) At Lagarde (Marne–Rhine canal, between Saarburg and Nancy) the traffic towards France is 682,581 tons, almost entirely coal (640,802 tons), with some cement (10,000 tons), clay (5,000 tons), stone, bricks, and tiles (12,000 tons), and chemicals (2,763 tons). Towards Germany the traffic is 483,540 tons, chiefly iron-ore (*minette* and pyrites, 221,000 tons), graphite and ochre (33,000 tons), basic slag (16,000 tons), gravel and sand (25,000 tons), other slag (21,000 tons), lime (17,000 tons), soda (7,000 tons), coal and coke (96,000 tons). Three-quarters of the barges are German, the rest mostly French. Traffic is well distributed over the year, but busiest in summer.

(*d*) At Novéant (Moselle canal, between Pont-à-Mousson and Metz) the traffic into France is 18,881 tons, chiefly coal, with some iron goods, clay, and bricks. The traffic going north is 76,395 tons, mostly lime (54,000 tons) and slag (13,000 tons). German and French barges are in the proportion of 6 to 1.

Crossings of the Vosges

The purpose of this section is to give short descriptions of all the main and secondary passes leading over the Vosges. It has already been observed that the Vosges chain is exceptionally rich in good passes; over a dozen carriage-roads cross the watershed between Belfort and Zabern. We shall not deal with footpaths or rough tracks.

1. *Bâlon d'Alsace.*—Road summit 1,178 metres. The road,

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which runs entirely within French territory, connects the Moselle valley (Remiremont–Épinal–Nancy) with Belfort. At St. Maurice it rises, winding at a regular gradient, and crosses the ridge only about 70 metres below the summit of the Bâlon d'Alsace, then descending in the same way to Belfort. This is the highest of the Vosges passes, and the least likely to be crossed by a railway at any time.

2. *Col de Bussang.*—So far as ease of transit and importance of traffic are concerned this is probably the chief of all the Vosges passes. The road summit is only 734 metres, and the climb to it from Bussang is trifling, being only about 100 metres in all. The col is a deep notch in the Bâlon d'Alsace ridge, and the tunnel which carries the road, 250 yards long, still further diminishes the height of the pass. The descent to Wesserling on the Thur is about 300 metres.

It was this pass over which a railway was to have been built in 1870. As the railway already runs to Bussang, it could easily be extended to the summit of the pass; the eastern slope is steeper (the average slope between the summit and Wesserling is 1 in 33) and would require some engineering.

3. *Col d'Oderen.*—This is a pass of secondary importance. It leads from Krüt in the Thur valley (a few miles above Wesserling) to Saulxures in the Moselotte valley, and so to Remiremont and Épinal. The road summit is 889 metres; it is a good second-rate carriage-road without excessive gradients, though the whole east side is decidedly steep, much more so than in the case of the Col de Bussang. Between the summit and Krüt the road falls 400 metres in 7 kilometres (average gradient 1 in 17½).

4. *Col de Bramont.*—This is the third of the Thur valley passes; it leads from the very head of that valley to La Bresse on the Moselotte, and thence either to Remiremont or Gérardmer. From La Bresse the road climbs 650–700 metres in 8 kilometres, reaches a level of 958 metres at the summit in forest, and winds down the very steep descent into the Thur valley, dropping 400 metres in 7 kilometres, when it reaches Wildenstein. The gradients are fairly steep, and, though the road is good, the pass is too remote, lying at the extreme end of the long Thur valley, to attract much traffic. The railway does not come nearer than Cornimont on the one side and Krüt on the other.

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5. *Schlucht.*—The Schlucht—the 'St. Gothard of the Vosges'—is only a very little lower than the Bâlon d'Alsace pass, having a summit elevation of 1,139 metres; but in spite of that fact it is one of the most important and frequented passes. It leads directly from Gérardmer to Münster, and thus connects Colmar and the Neu Breisach Rhine-crossing with Rambervillers and Nancy; and it comes nearer than any other pass of the High Vosges to being crossed by a railway, since each side is supplied with an electric tram. The tram on the Lorraine side leaves Gérardmer as a steam tram, and is electrified from Retournemer to the summit. From near the summit a branch strikes off southward and ascends the Hohneck by an easy gradient along the ridge. The electric tram on the Alsatian side starts from Münster, and climbs from the valley-bottom by means of a rack and pinion, the ascent here being steep. The two trams do not connect; their respective stations are a hundred yards apart, one on each side of the frontier.

These light railway lines, and its voluminous traffic, the Schlucht owes less to its commercial importance than to its attractions for the tourist. It is the best starting-point for ascents of most of the chief Vosges peaks; and the pass itself, with its heavily timbered slopes to west, precipices, and pine woods to east and open pastures on the summit, is extremely picturesque.

The whole of the eastern slope is steep, the average gradient between Münster and the summit (10 miles) being about 1 in 25, and some parts a good deal steeper. On the western side the gradients are about the same, but last for 5 miles only, between Longemer and the summit.

6. *Col du Bonhomme.*—This leads from St. Dié by way of the upper Meurthe valley (Fraize, Plainfaing) to Le Bonhomme (Diedolshausen), La Poutroye (Schnierlach), Kaysersberg, and Colmar. The road summit is 959 metres; from Fraize to the summit is 6 miles, with an average gradient of 1 in 25, the descent to La Poutroye (railhead) being the same distance and the same gradient. This is the least convenient and least frequented of the first-class passes, the Weiss valley on its Alsatian slope being a comparatively remote and secluded upland basin without any large town.

7. *Col de Ste. Marie.*—This is, with the exception of the Col de Bussang, the most accessible and convenient of all the

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High Vosges passes. It leads from St. Dié to Markirch, thus connecting Lunéville and Nancy with Schlettstadt. From St. Dié the road traverses level ground and then rises gently, as it crosses the St. Dié basin ; after about 7 or 8 miles the rise begins, and the road climbs steeply 300 metres to the summit (763 metres), with an average gradient of 1 in 17. Hence the descent to Markirch has an average gradient of 1 in 15 for about 3 miles. There is a motor-omnibus service over the pass ; the railheads are St. Dié and Markirch, 15 miles apart.

8. *Col d'Urbeis* or *Col de Lubine.*—A second-rate pass connecting Weiler with Provenchères; and thus supplying an alternative route between Schlettstadt and St. Dié. The pass, which crosses the ridge just south of the Climont, is low and easy (600 metres at the summit). From Provenchères the road rises only about 180 metres to the summit in 6 miles, and then descends 200 metres in 3 miles (average gradient 1 in 25) to Urbeis in the Weilertal. It is not much frequented, but this is due to the existence of the much more direct pass, No. 7, between Schlettstadt and St. Dié. Only local traffic uses the Col d'Urbeis.

9. *Col de Saales.*—This is the lowest of all the High Vosges passes, and in many ways a most convenient one. It joins the St. Dié basin to the Breusch valley, giving a direct and easy road from St. Dié to Schirmeck, the manufacturing districts of the Breusch, and Strasburg. The summit is only 580 metres in altitude, a rise of under 250 metres from St. Dié in 10 miles (1 hr. 20 min. by motor omnibus) ; this gives an average of 1 in 50 for the ascent, but half the rise is accomplished in the 2 miles following Provenchères. On the Alsatian side there are no steep gradients anywhere.

A railway runs all the way from Strasburg to Saales, which is practically the summit ; there is nothing to prevent its being continued another 10 miles downhill to St. Dié. Here, as in the case of the Col de Bussang, but still more obviously, the absence of a railway across the watershed is due to political causes, not to any difficulties of construction.

The Col de Saales is, however, not a pass of first-rate importance for through traffic. A railway would be of great local value, but it would not carry much long-distance traffic ; for Lunéville and all parts farther north the present line by Zabern

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would be shorter, and the Saales railway would never compete, for traffic between Alsace and the Saône–Doubs basin, with that passing through Belfort. For local purposes, however, the railway would be of great utility, connecting two such industrial areas as those of St. Dié and the Breusch valley.

10. *Col du Nantz.*—A pass of secondary importance, connecting Senones with the Breusch valley. Leaving Senones (railhead) the road goes eastward up a side-valley and crosses the watershed at an altitude of 640 metres. The rise is about 300 metres in 5 or 6 miles, steep towards the end. From the pass it descends to St. Blaise, on the Saales–Strasburg railway, dropping 200 metres in 4½ miles, and accompanied by a light railway used for transporting timber. It is a low and easy pass, but only of much use for local traffic, though in going from Nancy or Lunéville to the Breusch valley it is convenient, being 100 metres lower than the Donon, and 12 miles shorter than the Col de Saales without being much higher.

11. *Donon.*—This is a pass of some importance, giving a direct line between the Breusch valley and Raon-l'Étape. Its chief importance consists in its connexion with a road running west through Rambervillers and Charmes to Neufchâteau.

The pass begins at Raon-sur-Plaine, at the head of the Plaine valley (narrow-gauge railway from Raon-l'Étape), at an altitude of 431 metres. The road begins to rise almost at once, and in about 3 miles reaches the summit, on a southern shoulder of the Donon, altitude 739 metres. The average gradient is about 1 in 14. This summit is a rather important road-centre; German strategic roads run north to St. Quirin and Alberschweiler, and a direct road also comes in from Senones by the Col de Prayez. The road winds down from the summit at an average gradient of 1 in 14 to Grandfontaine, and then down a lateral valley of the Breusch to Schirmeck, 400 metres lower than the summit.

12. *Pass of Dabo.*—A second-rate pass, giving a direct line between Saarburg and Wasselonne. The road ascends from Dabo (alt. 511 metres) to the summit, 150 metres higher, in about 4½ miles, and then winds down a steep descent to Obersteigen, falling 200 metres in 2 miles, and then continuing downhill to Wasselonne. The summit of the pass lies on the northern shoulder of the Wolfsberg.

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13. *Zorn Valley.*—This is the line taken by the railway, the Marne–Rhine canal, and a road. The road in question is not the historic Pass of Zabern, for which see No. 14 below; but, though less direct, it crosses the watershed at a lower elevation. From Saarburg it runs south-east through Hochwalsch, and after climbing to about 360 metres drops into the Zorn valley at Haselburg. Two or three miles lower down, the railway and canal enter the valley, and all three follow it down to Zabern.

The canal and railway pass through a tunnel halfway between Saarburg and Zabern, and the ascent to their summit-level is in consequence very slight.

14. *Pass of Zabern.*—This, the most important of all the Vosges passes, connects Pfalzburg with Zabern. At Pfalzburg three roads come in from the west, from Saarunion, Fénétrange, and Saarburg respectively. The Zabern road leaves Pfalzburg in an easterly direction and strikes across the plateau, rising very gently, till after nearly 4 miles it reaches the summit at an elevation of 404 metres. This brings it to the very edge of the plateau; in front lies the Plain of Alsace, to which the road descends, winding boldly down the steep face of the escarpment to Zabern—a drop of 200 metres in a little over 2 miles.

15. *Southern Zinsel.*—The Southern Zinsel is a small stream of the Low Vosges, so called to distinguish it from the larger and better-known Zinsel farther north. It flows into the Zorn below Zabern. Its valley, narrow, flat-bottomed, and hemmed in by precipitous sandstone cliffs, carries a road which runs from Buchsweiler to join the Pfalzburg–Saargemünd main road. This it does at an elevation of only about 250 metres above sea-level, its course in the Zinsel valley having a negligible gradient.

16. *Lützelstein* (*La Petite Pierre*).—This is a somewhat important road-centre. It is a plateau-fortress like Pfalzburg, and lies on a road which climbs the escarpment from Buchsweiler and joins the Pfalzburg–Saargemünd road near Drulingen. Other roads run north, south, and north-east (to Ingweiler).

17. *Moder Valley.*—This valley carries a road and railway connecting the Saar basin with Ingweiler and Hagenau. The Eichel, a tributary of the Saar, leads with very gentle gradients to within a mile or so of the watershed; a short, steep rise (which the railway avoids by means of a tunnel) brings the

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road to the summit near the village of Puberg, at an elevation of about 320 metres ; a similar descent brings it to the Moder valley, which leads down at a hardly perceptible slope to Ingweiler.

18. *Zinsel Valley.*—This is an unimportant line of communication, though the valley itself is important for the forges and iron-works which it contains. It is possible to get from Saargemünd to Hagenau by crossing the watershed at Lemberg and coming down the Zinsel past Mutterhausen and Bärental ; but the Bitche road, No. 19, is more usual.

19. *Bitche.*—This is the third of the plateau-fortresses which between them control all the chief crossings of the Low Vosges. The town itself lies almost on the crest of the hill, which here reaches an elevation of just over 400 metres ; the main roads lead to Saargemünd, Hagenau, and Weissenburg, while a railway here crosses the range from Saargemünd to Hagenau.

From Saargemünd the road first rises to Gross Rederchingen, and then after Rohrbach crosses a deep valley, out of which it has to climb steeply to the summit of the plateau overlooking Bitche. The railway takes a much easier line by following the almost level ridge from Rohrbach to Lemberg, and so north-east and north to Bitche. Descending towards Hagenau, the gradients are at first rather steep, but after two or three miles become very gentle.

The Bitche–Weissenburg road at first crosses a level plateau and then descends gently into the Sauer valley, which it follows down-stream to Lembach. Here it strikes north-eastward uphill and climbs to the summit of the escarpment (about 500 metres) overlooking Weissenburg, to which it then steeply descends, winding down the hill-side.

Communications of the Briey Plateau

The deficiency of this region in means of communication is due to its unfortunate political situation since 1871. So inevitable a battlefield as the Briey plateau and Woëvre was unlikely to be thoroughly supplied in advance with good lines of communication which would accentuate, for each side alike, the ill consequences of a defeat there. As a result, the Metz–Verdun railway, planned and begun before the war of 1870, remains a single line ; the same is true of the Thionville–Hayange–Longuyon railway ; and the only double lines which

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serve the ironfield surround it in a ring (Longuyon–Conflans–Chambley–Arnaville–Metz–Thionville–Luxemburg–Longwy), hardly touching the field itself, which is traversed only by an ill-planned network of single lines, including such anomalies as the absence of connexion between the adjoining villages of Jœuf and Moyeuvre.

One of the most obvious needs of this region is a canal service. Navigation extends down the Moselle to Metz, but not beyond; and this is the only available waterway. The projected Canal du Nord-Est would, if carried out, extend up the Chiers to Longwy; but this would be insufficient. Topographical conditions are suitable for canal construction, and it would be easy to build a canal from Longuyon to Briey, and to extend it thence both down the Orne to meet the Moselle and southward by Conflans across the Woëvre to Toul or Commercy. In all these cases the gradients are extremely gentle and the differences of level slight.[1]

[1] For a detailed map of the railways of the Briey plateau and their connexions see *Manual of Belgium and Neighbouring Territories* (I. D. 1168 A), Atlas, map 7.

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APPENDIX A

BIBLIOGRAPHY

THE following bibliography does not aim at completeness. It would have been easy to increase its bulk enormously, especially in the historical section. Thus the very large number of books dealing with details of early history, and the still larger output of recent propagandist literature (almost exclusively on the French side, the Germans preferring to maintain the non-existence of the Alsace-Lorraine question, and, having no case, not to attempt the statement of one), have been only sampled. In the case of mineral resources again the field has been covered in part by the *Manual of Belgium and the Adjoining Territories*; and the bibliographical matter contained in that volume has not been reprinted here.

The bibliography is arranged according to subjects; but the divisions are not mutually exclusive, and valuable material on one subject is in some cases due to a work classified under a different heading. It has not been thought necessary to supply complete cross-references for such cases.

Every work included has been consulted, except for a very few which are known only through quotations, but are evidently important sources.

MAPS

The accompanying Atlas consists only of small-scale maps designed to give broad ideas of distributions rather than topographical detail. The most useful general map for topography is the French Carte de France et des Frontières, 1 : 200,000 (about 3·15 miles to the inch), edition 1912. For a more minute study of the ground the larger-scale German and French topographical maps are necessary. A very useful small-scale map intermediate between those of the accompanying Atlas (i. e. 1 : 1,000,000) and the French 1 : 200,000 is the Carte de France dressée au Dépôt des Fortifications, 1 : 500,000.

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APPENDIX B

LIST OF MAPS IN THE ACCOMPANYING ATLAS

1. Relief Panorama.
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5. Woods and Forests.
6. Density of Population.
7. Variation of Population.
8. Native Dialects.
9. French-speakers in German Alsace-Lorraine.
10. Roman Alsace-Lorraine.
11. Frankish Alsace-Lorraine to Charlemagne.
12. The later Frankish period.
13. History: Fourteenth and Fifteenth Centuries.
14. History: To the French Revolution.
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